

ENVIRONMENTAL ASSESSMENT BOARD



ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 51

DATE: Tuesday, August 27, 1991

BEFORE:

HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act,
R.S.O. 1980, c. 140, as amended, and Regulations
thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro
consisting of a program in respect of activities
associated with meeting future electricity
requirements in Ontario.

Held on the 5th Floor, 2200
Yonge Street, Toronto, Ontario,
on Tuesday, the 27th day of August,
1991, commencing at 10:00 a.m.


VOLUME 51

B E F O R E :

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DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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1 ---Upon commencing at 10:00 a.m.

2 THE CHAIRMAN: Be seated, please.

3 Mr. Campbell?

4 MR. B. CAMPBELL: Mr. Chairman, I spoke
5 some weeks ago now with Board staff about the
6 unavailability of one of our witnesses this afternoon,
7 Ms. Mitchell is unable to be here this afternoon. I
8 have spoken to Mr. Poch about that matter. He is
9 content to continue with the balance of the panel for
10 this afternoon. We understand there may be a few rough
11 spots as a result of that, but if it is absolutely
12 necessary we could come back to those matters tomorrow
13 morning. If that arrangement is satisfactory to the
14 Board, Mr. Poch and I are satisfied we can work out any
15 problems that may arise and I would recommend that we
16 proceed on that basis.

17 THE CHAIRMAN: Is that satisfactory, Mr.
18 Poch?

19 MR. D. POCH: That is fine, Mr. Chairman.

20 THE CHAIRMAN: We will proceed on that
21 basis.

22 PAUL JONATHAN BURKE,
23 AMIR SHALABY,
24 JULIA MARION MITCHELL,
25 MARION ELIZABETH FRASER,
LYN DOUGLAS WILSON,
WILLIAM OSBORNE HARPER; Resumed.

1 CROSS-EXAMINATION BY MR. D. POCH (Cont'd):

2 Q. Panel, I would like to just touch on
3 one of the subtleties in your strategy elements.
4 Strategy 2.1.1 says that Ontario Hydro will aim to
5 develop a mix of demand and supply options that
6 provides electricity service to customers at low total
7 cost.

8 And at 3.1.1 you say demand reducing
9 options through increased electrical efficiency will be
10 aggressively pursued to the full extent they are
11 economic compared to available supply options in the
12 relevant planning period.

13 I notice that 2.2.1 says "low" and not
14 lowest cost or least cost. Could you explain for us
15 why you chose the words "low cost"?

16 MR. SHALABY: A. I think we touched on
17 that a bit in Panel 3. In a nutshell, we are saying
18 that there are things such as corporate targets and
19 standards for pollution control or radiation levels,
20 and so on, that are adopted by the corporation and lead
21 to costs that are higher than the absolute minimum.

22 We could function at lower cost, we could
23 provide electricity at lower cost but given those
24 corporate standards and guidelines, pollution control,
25 environmental protection efforts and many other,

1 employment and other things, make the costs of
2 electricity not the very least possible but certainly
3 very close to it.

4 Q. You noted - the cite, you don't need
5 to turn it up, is page 28 of Exhibit 34 - you noted
6 there that many people indicated they were prepared to
7 accept additional cost to protect the environment.

8 Can I take it from that and your answer
9 today, that you are prepared in principle to deviate
10 from least cost in narrow dollar terms, to some extent,
11 in an effort to move towards least total social cost,
12 hence the phrase low cost meaning low dollars costs but
13 perhaps allowing you to get to a lower social cost on
14 balance?

15 A. Are you referring here to the issue
16 of monetizing external costs again, or am I too
17 sensitive to that?

18 Q. No, I think you are too sensitive on
19 that topic.

20 I am really just saying, the upshot of
21 what you have told us, that is that you relaxed, you
22 didn't choose least cost, least dollar cost, you chose
23 low dollar cost, if I can read in the word "dollar"
24 without doing injustice to what you are saying,
25 precisely to allow you to lower other kinds of costs,

1 environmental and social costs, and thus overall get
2 closer to least social cost; is that fair?

3 A. You may see it going in that
4 direction but you are really attributing much more
5 knowledge of where exactly least social costs are and
6 how we head to them. It's not that precise, nor is it
7 that determinable.

8 The deviation from least cost to low cost
9 is just recognition that we are unlikely to hit the
10 absolute bottom low cost every day of the year, every
11 hour of the year. There are things that we do that
12 make costs a little higher than the least.

13 Q. Are you telling me then that this
14 deviation toward -- this use of the word "low" is not a
15 conscious strategy to allow you, precisely to allow to
16 you recognize environmental costs and include them?

17 A. I'm not sure whether it is precisely
18 to recognize going through the social costs or not.

19 Q. Maybe I can help you a bit. If we go
20 to, then, page 28 of Exhibit 74. And I should say as a
21 preface, when we are talking about these strategy
22 elements, they are the elements that you use for
23 planning as opposed to day-to-day operation. These are
24 the elements that are intended help you shape your plan
25 development?

1 A. That's right.

2 Q. I took my sense of the meaning here
3 from the second full paragraph on that page which
4 reads:

5 Strategy element 1.3 specifies low
6 cost and not lowest cost, so that Ontario
7 Hydro can take a leadership role in
8 protecting the environment which will
9 mean some increase in cost.

10 And I take it there "cost" implies dollar
11 cost.

12 Similarly, Ontario Hydro may incur
13 higher cost in encouraging the social
14 benefits associated with its activities,
15 and this trade-off is implicit in the
16 corporate goal which has the dual
17 objectives of greatest benefit to the
18 community and greatest value to the
19 customer.

20 And it goes on to make the point that I
21 referred to earlier about this being reflective of the
22 consultation results.

23 I had read that as implying, at least, if
24 not directly stating, that this corporation was
25 prepared to acknowledge that least dollar cost could

1 well not be least social cost and that's why you have
2 to compromise on that point; is that fair?

3 A. I read no more into it than it says,
4 Mr. Poch, that strategy element specifies low, not
5 lowest to allow leadership in environmental protection
6 and to recognize that Hydro incurs higher costs in
7 encouraging the social benefits associated with these
8 activities. I don't want to interpret it any further
9 than what it says. It's written clearly and that's all
10 I take out of it.

11 Q. Who developed this document? Who
12 could I ask questions about the intent behind it?

13 A. It's in Ontario Hydro, a large number
14 of people, as again was mentioned several times,
15 contributed to the development and review and approval.
16 It was finally approved by our own Board of Directors.

17 Q. The difficulty I face, Mr. Shalaby,,
18 you are in a hearing and this is the strategy elements
19 that determine your plan, we have established that, I
20 would like to be able to probe what the meaning of
21 those words are in this exhibit.

22 THE CHAIRMAN: I think you can do that
23 but you have to do it in a little more specific way.

24 Mr. Shalaby's evidence, as I understand
25 it, is that Hydro's position on the low versus lowest

1 is as stated here. Now, if you want to deal with that
2 statement and ask him questions about it, or other
3 members of the panel, that is fine, but I don't think
4 that you can ask him for some generalization
5 qualification on that.

6 MR. D. POCH: All right, Mr. Chairman.

7 Q. Mr. Shalaby, would you agree that the
8 element from the wording here, is intended to allow you
9 to recognize costs other than simple dollar costs?

10 MR. SHALABY: A. Recognize costs other
11 than simple dollar cost, I don't know what that means.
12 Like what? Give me an example.

13 Q. Environmental costs and social costs
14 as it refers to.

15 A. We call it environmental impacts and
16 social impacts.

17 Q. That is fine.

18 A. Yes.

19 Q. You agree with that interpretation?

20 A. The statements says two things: One,
21 it is recognizing, it is a statement of what is today.
22 Today we incur costs higher than the minimum because we
23 do certain things in environmental protection and other
24 things. And also you are interpreting it as allowing
25 Hydro to do things. I am interpreting it more as

1 describing what is today and what will be in the next
2 few years.

3 We operate in a way and plan in a way
4 that add costs to the absolute lowest cost. That's
5 what we are saying. That's exactly what we are saying
6 here.

7 I don't read into it a request or a
8 permission or an allowance to do things that are
9 different from what we are doing today, continuation of
10 what we are doing today.

11 Q. You are saying to me, then, to some
12 extent, today, the corporation and the way it conducts
13 business then and in the way it plans, recognizes that
14 least dollar cost is not always the most socially
15 desirable outcome and that it is perhaps better to have
16 a low dollar cost and take account of some
17 environmental and social impacts which can be avoided?

18 A. Yes.

19 Q. I would like to suggest a definition
20 to you that we could use for proceeding, which would be
21 that a least cost resource plan, and if you prefer, a
22 least cost and impact resource plan, is one with the
23 lowest total present worth of expected costs and
24 impacts to society for providing a given level of
25 reliable energy service.

1 THE CHAIRMAN: Slower, please. You are
2 giving him a definition. Least cost impact?

3 MR. D. POCH: Q. A least cost, or least
4 cost impact resource plan, is one with the lowest
5 total - I emphasize the word "total" - present worth of
6 expected costs and impacts to society for providing a
7 given level of reliable energy service.

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1 [10:14 a.m.] MR. B. CAMPBELL: Mr. Chairman, just
2 before we proceed farther, Mr. Shalaby may be able to
3 to deal with this in the context of the Demand
4 Management Panel, but this sure looks to me like
5 something that is directly relevant to how you combine
6 all of the various options that we will be talking
7 about in this panel and in later panels into a plan,
8 and I would take objection to straying into that area.
9 That is a matter in which there will be a different set
10 of witnesses and a later panel once we have worked
11 through the options and look at combining major supply
12 facilities.

13 THE CHAIRMAN: On the other hand, there
14 is some need to look at demand management in the
15 context of broader concepts and the extent to which
16 this panel would be able to assist Mr. Poch, I would
17 think that would be appropriate, would it not?

18 MR. B. CAMPBELL: Yes, and that was the
19 reason for the preamble to my objection.

20 THE CHAIRMAN: Okay.

21 MR. D. POCH: Well, perhaps I can proceed
22 and if I go too far or dwell too long, I am sure my
23 friend will remind me.

24 Q. First of all, can you accept that
25 definition as reasonable on its face?

1 MR. SHALABY: A. Yes.

2 Q. And just so we all are talking in the
3 same terms, can we agree that the service we are
4 talking about here refers to the service that
5 electricity provides, such as light or cooling or drive
6 power and so on, not the kilowatthours themselves as a
7 commodity?

8 A. That is the definition we accept in
9 demand management.

10 Q. Customers don't desire electricity
11 per se; they want the services it can provide. We have
12 agreed on that before I am sure.

13 A. Yes.

14 Q. Would you agree that an appropriate
15 objective of Hydro's resource planning should be a
16 resource plan expected to provide desired levels of
17 energy service as we have explained to customers at the
18 lowest total cost and impact possible to society?

19 A. I accept the objective. Now to
20 translate that into something that Hydro should pursue
21 or should have as its objective, you get into mandates.
22 And the definition you gave has the words "resource
23 plan" and has the word "energy service". I read that
24 as all kinds of energy forms and all kinds of services
25 to all kinds of sectors in the economy. It sounds like

1 a provincial energy policy issue rather than a
2 step-by-step electricity demand and supply plan. It
3 has to it the context of different energy forms and it
4 has to it the context of different resources.

5 Q. All right. You are saying you agree
6 with the intent. You agree it is an appropriate
7 intent. You are just cautioning me that it may not all
8 be within Hydro's powers given the mandate which, of
9 course, we see is changing but which has presumably
10 some limitations; is that fair?

11 A. Yes.

12 Q. All right. Any other --

13 A. The other thing is that, of course,
14 to determine the lowest total present worth of expected
15 costs and impacts. In theory it sounds like a very
16 desirable objective, but you try and do that and you
17 mean 101 different hurdles. It is not as easy as it
18 sounds.

19 Q. All right. Is this one of the
20 strategy elements behind the plan; that is, a least
21 cost resource plan with the lowest total present worth
22 of expected costs and impacts to society for providing
23 a given level of reliable energy service?

24 A. Not in those words, no.

25 Q. Do you believe it is captured by the

1 strategy or must we read it in somewhere else?

2 A. The strategy was attempting to give
3 direction that the Ontario Hydro planners can carry
4 out, this kind of direction and statement or
5 definition. If you give this to somebody and say go
6 and do a plan that does this, there are difficulties in
7 there that will stand in the way.

8 Q. All right. You would agree I take it
9 that Hydro shouldn't set goals, and in DSM in
10 particular. In the DSM plan we shouldn't be setting
11 goals that are the ones that would be appropriate in a
12 private sector profit-oriented business, that you have
13 a different mandate.

14 A. What is the intent of that again?

15 Q. Well, Ontario Hydro has a different
16 mandate quite clearly than a private sector
17 profit-oriented company.

18 A. Yes.

19 Q. And that in setting your goals, your
20 strategy elements and objectives, it is appropriate to
21 take that into account?

22 A. Absolutely.

23 Q. All right.

24 A. And one of those is, besides
25 providing low cost product, our mandate also tells us

1 about providing benefit of service and value to the
2 community you serve; that is, it goes hand in hand with
3 the public service orientation of our mandate.

4 Q. Low cost is not something that is --
5 those words don't appear in the Power Corporation Act,
6 do they?

7 A. I don't make it a regular reading,
8 the Power Corporation Act, so I don't know.

9 Q. Okay. Do you believe that Ontario
10 Hydro should knowingly increase the expected costs to
11 society, costs and impacts to society, for providing a
12 given level of reliable energy service if its mandate
13 allows it to do so with lesser total cost and impact?

14 A. You are saying should Hydro knowingly
15 go above the lowest cost?

16 Q. Yes.

17 A. Well, I just said that we do.

18 Q. All right. I think we are getting
19 into a semantics difficulty here. I was asking you if
20 you think it is appropriate for Hydro to knowingly
21 increase the expected costs and impacts, the total cost
22 as I have defined it - I know you don't like the word
23 "cost" but read into that the impacts - to society for
24 providing a given level of reliable energy service.

25 Given your mandate, do you agree it is

1 appropriate where you have got options to opt for the
2 path within your mandate that gives the lowest mix of
3 cost and impact?

4 MR. B. CAMPBELL: Well, I am sorry,
5 hasn't the witness answered this question about a dozen
6 times at this point? He has said that, in fact --

7 THE CHAIRMAN: Just a minute, Mr.
8 Campbell. Perhaps inferentially, but perhaps the
9 question now put in the direct form he can answer.

10 MR. SHALABY: If we have a different
11 number of options, the path we choose, I said, is not
12 necessarily the least cost.

13 MR. D. POCH: Q. And by that you mean
14 least dollar cost?

15 MR. SHALABY: A. Least dollar cost.

16 Q. All right.

17 A. It is towards the low cost bunch of
18 options, bunch of alternatives that we have, and we
19 spend a large number of months and years articulating
20 exactly what it is that we do and how is it that we do
21 it and what guides us and what the rationale is and it
22 is written in volumes and volumes of paper.

23 Q. I hear what you are saying as you do
24 deviate somewhat from least dollar cost, but I am
25 asking you, do you believe you should knowingly where

1 you have got an option increase the expected costs and
2 impacts, or do you believe your mandate is such that in
3 such cases, you have an obligation to select the option
4 with the least total cost and impact?

5 A. I believe our obligation is to choose
6 options that have low costs and low impacts, not the
7 least but not the most expensive either.

8 Q. Why wouldn't you feel obliged to take
9 the ones with the least total mixed cost and impact -
10 let's call cost just one impact - total impact, total
11 negative impact?

12 THE CHAIRMAN: Well, you have introduced
13 a new word there, "negative", because impact can be
14 positive or negative, which is one of the difficulties
15 I have in following the question.

16 MR. D. POCH: That is good point, Mr.
17 Chairman. Perhaps we should define our terms,

18 Q. Don't you feel your obligation is to
19 pick the option which has the best outcome in terms of
20 both impacts and dollar costs?

21

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...

1 [10:25 a.m.] MR. SHALABY: A. I won't quarrel with
2 that. I want to see where this takes us all. I will
3 be brief until we get to the end of it.

4 Q. It may take a while, but....

5 A. Okay.

6 Q. Could you turn up in our materials,
7 Volume 2, at page 148, this is Exhibit 270. Page 148.

8 This is a document provided in response
9 to Interrogatory 4.20.93 entitled "Supply Side
10 Environmental Effects of Ontario Hydro's Demand
11 Management Plan".

12 Panel, this document, coupled with the
13 literature review of the direct impacts, environmental
14 impacts, environmental and social impacts, I should
15 say, of DSM, which Ms. Couban referred to, these
16 documents purport to show how the impacts of DSM and
17 this one in particular, I take it, purports to show how
18 more or less DSM would impact the environment in terms
19 of its effect on the supply plan?

20 A. Yes, that's what this document shows.

21 Q. And if you go to page 159, which is
22 page 9 of that document, we see a summary there of
23 natural environmental valuation of alternative DSM
24 cases. Perhaps we can just define terms.

25 The first column is obviously Plan 15 as

1 presented. The second column?

2 A. The second column is a plan that is
3 called H1. H1 is a plan that does not have electric
4 efficiency improvement or load shifting measures that
5 are uncommitted.

6 Q. So, from that then we can glean that
7 the third column is the difference between the two and
8 the fourth column is the ratio between the two and so
9 on?

10 A. Yes.

11 Q. And H2 is?

12 A. H2 is a plan that does not have the
13 uncommitted load shifting but has the electrical
14 efficiency improvement.

15 Q. This document gives us some numbers
16 for resource use and air emissions in teragrams or
17 curies or gigagrams, what have you. There are
18 different units for each impact where there are
19 presented the findings of the environmental benefits or
20 disbenefits of different DSM plans or even of the DSM
21 plan, in terms of the ultimate impacts. To be brutal,
22 where is, you know, the leukaemic children and risk of
23 catastrophe compared.

24 A. I think that would be more
25 appropriately discussed at Panels 10 or 11.

1 Q. So the Panel 4 then, DSM --

2 THE CHAIRMAN: I don't quite follow that
3 question. As I understand it, the chart shows that
4 certain physical results of using Plan 15 and then how
5 those results would be different with either EEI and LS
6 taken out, or LS alone taken out. And then I thought
7 you were asking about, well, what about the impacts of
8 the demand management programs themselves. Is what
9 what you were --

10 MR. D. POCH: No, Mr. Chairman, perhaps I
11 was unclear.

12 THE CHAIRMAN: If we are getting into the
13 issue of how you measure environmental effects, that
14 was the subject matter really of Panel 3, wasn't it?

15 MR. D. POCH: Well, I think we
16 established in Panel 3 that Hydro doesn't include those
17 impacts in its avoided cost and I obviously --

18 THE CHAIRMAN: I'm sorry, it should be
19 Panel 2 and 3, I meant to say.

20 MR. D. POCH: In Panel 2 we discussed
21 what, if any, impacts the current facilities have. And
22 I had understood, Mr. Chairman - I may have been
23 mistaken - but I had understood that each technology
24 specific panel would be able to tell us about the
25 environmental impacts of that particular option or

1 technology.

2 THE CHAIRMAN: But we are really dealing
3 with the demand management programs here. And if you
4 are talking about the environmental effect of putting a
5 different kind of light bulb into the residential
6 homes, I would understand the question better. But if
7 we are talking about what is the effect of increasing
8 or diminishing the supply side, that surely should be
9 in the supply side panels.

10 MR. D. POCH: Well, I am content to, I'm
11 certainly content to visit this matter at that time,
12 Mr. Chairman.

13 Q. And I just wanted to be sure, to
14 close off with this panel, that it isn't this panel's
15 responsibility to tell us about the avoided
16 environmental ultimate impacts due to substituting DSM
17 for supply.

18 MR. SHALABY: A. It is not.

19 Q. Apart from, obviously apart from this
20 quantification. I take it this quantification is
21 appropriate to be dealt with then in panel -- with the
22 supply panels?

23 THE CHAIRMAN: Just so I understand it.
24 I think it would be appropriate for this panel to
25 discuss environmental impacts of implementing certain

1 programs ex-supply side impacts. But the supply side
2 impacts should be dealt with in the supply side panels.

3 MR. D. POCH: Q. First of all, you can
4 agree with the Chairman's interpretation: that's not
5 going to present a difficulty for subsequent witnesses?

6 MR. B. CAMPBELL: No, it is not.

7 MR. D. POCH: Thank you, Mr. Campbell.

8 Q. And just in terms of my question
9 then, just in terms of the Chairman's suggestion, the
10 exhibit we saw that was included in the the package,
11 265, I believe it was, Ms. Couban's materials, where we
12 saw this literature review, I think it was a Barakat &
13 Chamberlain study, of the impacts of DSM programs.
14 That's the document where we actually can see or at
15 least we can begin to see the impacts of the DSM
16 programs themselves directly as opposed to the
17 displacement effect?

18 MR. SHALABY: A. Yes.

19 Q. And I don't think we need to turn to
20 that. I take it that while that is just a literature
21 review, the initial findings there are that on balance
22 the DSM programs give us, in fact, give us positive
23 impacts in that they give us opportunities to deal with
24 wastes that are out there in the world in a more
25 structured way; is that fair?

1 A. I don't recall those exact words but
2 I think what it did is indicate, as confirmed, our
3 feeling that demand management programs have manageable
4 and the most negligible environmental impacts. Things
5 to do with the manufacturing disposal of energy
6 efficient equipment is really the extent of the impact
7 of demand management programs, indoor air quality, that
8 kind of thing.

9 It listed what environmental impacts come
10 from demand management measures and I think it made the
11 conclusion that there are issues that are manageable
12 and are less than the supply side impacts.

13 Q. I had just looked at the summary, the
14 executive summary, and it seemed to give an awful lot
15 of examples apart from the obvious one that you reduce
16 supply; that for example emissions of CFCs can be
17 reduced below that that would otherwise be through
18 proper program design and mitigation measures; in other
19 words, without DSM. Similarly for HCFCs --

20 MR. B. CAMPBELL: Just a minute. If you
21 are going to interpret the document, I think perhaps--

22 MR. D. POCH: Is that right? Can we get
23 that out?

24 MR. B. CAMPBELL: --the witnesses should
25 turn it up because that was not my recollection of the

1 context of that statement that it was with or without
2 DSM programs. I took that point, my recollection of
3 that point is that the proper program design can reduce
4 CFC impacts; that is, within the family of program
5 design, rather than in comparison with or without DSM.

6 MR. D. POCH: Okay. Perhaps we should
7 just get the document out and we can discuss this
8 briefly. It's Interrogatory 4.32.13 which appears in
9 Exhibit 265, the government's materials relied on in
10 Panel 4. And it's the first document in that bundle,
11 and I was just looking at I, which is about four leaves
12 in, four sheets in, Executive Summary.

13 Q. This is just a literature review
14 after all and doesn't purport to be a detailed study.
15 Why don't we approach this, panel, with some common
16 sense. I know that will appeal to you.

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1 [10:45 a.m.] Mr. Wilson, if Hydro has a program which
2 encourages the replacement of old refridgerators with
3 new, efficient refrigerators, isn't it possible through
4 good program design to perhaps put a bounty on old
5 fridge, collect those old fridges and see to the proper
6 recycling or capturing of those CFCs?

7 Ms. Mitchell?

8 MS. MITCHELL: A. Yes, it is and we are
9 doing so.

10 Q. And would you agree that that, in
11 general, is a net benefit compared to leaving those
12 fridges to be disposed of at the municipal dump?

13 A. We believe that to be true, yes.

14 Q. So, that is a benefit of the program
15 and, indeed, depending on how you do the program, we
16 could have a greater or lesser benefit?

17 A. Yes.

18 Q. All right. And I take it the same is
19 true of PCBs in fluorescent fixtures?

20 MS. FRASER: A. Yes.

21 Q. And the same is true of mercury gas
22 or mercury in the emulsions of different kinds of
23 fluorescent fixtures? You can, to some extent,
24 centralize recovery and indeed recover that mercury and
25 other valuable materials?

1 MS. MITCHELL: A. I believe mercury is
2 absorbed by the gas so it doesn't represent a problem.
3 I'm not sure.

4 Q. I am sorry?

5 A. I believe mercury is absorbed by the
6 glass.

7 Q. Is it fair then, from your
8 experience, to say that DSM programs indeed are an
9 environmental opportunity, apart from their impacts on
10 the supply side, to manage some of the wastes and
11 hazardous products that are out there in the economy at
12 the moment.

13 MR. WILSON: A. Yes, I agree with that.

14 Q. Excuse me a moment, Mr. Chairman.

15 Panel, have we hit on the information
16 that's available, or that you have to offer at least,
17 about the relative environmental virtue of alternative
18 levels of DSM versus supply options and DSM generally
19 and its direct impacts?

20 A. I believe this exhibit captures the
21 essence of our assessment of the advantages and
22 disadvantages of demand management measures and the
23 effects on the environment.

24 Q. And the other one we referred to a
25 few moments ago --

1 THE CHAIRMAN: You are referring to
2 Exhibit 265; is that right?

3 MR. WILSON: I was, yes.

4 MR. D. POCH: Q. And the other exhibit
5 which we agreed we will talk about with later panels,
6 with the different scenarios, H1 and so on, that is the
7 evidence being offered at this point in time on the
8 differential impacts due to different levels of DSM?

9 MR. WILSON: A. That is correct.

10 Q. We have agreed a few moments ago that
11 you have got a strategy element specifically styled as
12 low cost as opposed to least cost, a recognition that
13 you can and perhaps - I think we have agreed now -
14 should seek out within your mandate and capability the
15 least total -- the best of the optimal societal plan.

16 MR. SHALABY: A. I'm not sure I agree to
17 that. I'm still awake. (laughter)

18 Q. Well, I had thought we had agreed
19 that it was appropriate where you had options to take
20 the option that was optimal for society, capital costs
21 and impacts.

22 A. Well, I agreed that as a statement
23 for perhaps a provincial policy objective may be
24 appropriate, but Hydro has mandate to carry out that
25 doesn't permit it to go into all those areas.

1 Q. I didn't mean to overlook the caveat,
2 the caveats you have offered.

3 A. Okay.

4 Q. But to whatever extent you are
5 allowed and to whatever extent you are capable to seek
6 out this more optimal package, how do you seek it? How
7 do you know you have got it on the DSM side? How do
8 you know you have gone far enough, you haven't gone too
9 far, if you don't have some kind of yardstick of the
10 environmental benefits or disbenefits and the social
11 benefits or disbenefits?

12 A. Well, I think we are presenting
13 information about the plan that we put together, the
14 alternatives to it, what the impacts would be without
15 the demand management, what the costs would be with and
16 without, and we are presenting all of that. This is
17 how we would know whether this is appropriate or not.

18 Q. That tells us that you haven't gone
19 too far, right, that the environmental benefits and
20 social impacts appear to be, on balance, quite
21 positive, and you have already indicated you haven't
22 gone past the line of economic virtue, narrow terms, so
23 that we wouldn't expect those environmental and social
24 impacts to -- you didn't learn that you went too far by
25 setting a target at the economic level. But how do you

1 decide when you have gone far enough?

2 A. I am not sure that we have enough
3 information to know whether we have gone too far or
4 not. I don't know that.

5 Q. Okay.

6 A. In fact, we have given evidence that
7 we give a 10 per cent credit economically to demand
8 management options, some would argue that we have gone
9 too far with that.

10 Q. All right. We will come back to that
11 in a few moments. I would like to turn to another
12 topic.

13 Element 3.11.2, and this can be seen in
14 Exhibit 74 at page 45.

15 THE CHAIRMAN: 74?

16 MR. D. POCH: At page 45. I will read
17 it, Mr. Chairman. I don't know that anybody needs to
18 turn it up.

19 Q. Customers who participate and receive
20 direct benefits should provide a
21 substantial contribution to the cost.

22 First of all, let's make sure I
23 understand this correctly. If you paid for the measure
24 entirely, and recovered your costs as you do for any
25 expenditure on the supply side in electricity rates

1 generally, I take it that wouldn't fulfill this
2 requirement. That wouldn't be what we are talking
3 about here.

4 THE CHAIRMAN: I'm sorry, could you
5 please repeat that question. I am not sure I followed
6 it.

7 MR. D. POCH: Q. If you went out, paid
8 for a DSM measure in a particular customer's home
9 entirely, it cost you something to do that, you charge
10 those costs -- you just put those costs into your
11 revenue requirement and it gets distributed throughout
12 everyone's rates, that wouldn't meet your test, that's
13 not what you mean by the customer has to provide a
14 substantial contribution. You mean that individual
15 customer for that individual measure has to provide a
16 substantial contribution?

17 MS. FRASER: A. Yes, I believe that's
18 what that statement means.

19 Q. Okay, all right. I would like to
20 spend a little time on this because I think this is one
21 of the key problems we have identified with your
22 strategy.

23 This and other limits and elements are
24 discussed in Exhibit 74, at pages 45, 46, through 48.
25 This is perhaps a good time, and in fact we will be

1 referring to Exhibit 74 now, and on page 47 we see
2 listed five bullets points. These are the five
3 reasons, Mr. Shalaby, which I promised you I would come
4 back to. The preamble is, however, there are a number
5 of reasons why full grants should not be made.

6 Can I take it, Mr. Shalaby, these are the
7 five reasons or groups of reasons which you went to
8 offer and which you would offer as the corporation's
9 reasons or rationale for the policy-limiting incentive
10 levels?

11 MR. SHALABY: A. Yes. And I want to add
12 that I mentioned during the last day or two, that it is
13 not meaningful or useful to discuss demand management
14 as a singular activity. We have hundreds of products,
15 hundreds of segments in the society that receive these
16 grants and do these activities, various sectors, and
17 what is appropriate in a certain sector is not
18 appropriate in another. But in general, we would like,
19 in general, the incentive policy to be guided with this
20 guideline.

21 Q. And indeed, the strategy elements are
22 general elements that helped shape the plan which is,
23 as you indicate, made up of many small or large
24 individual components.

25 A. That is right.

1 MR. D. POCH: Well, I will assure the
2 hearing board that we will come back to discuss some of
3 the particular programs. And I should say, Mr.
4 Chairman, I have endeavored to shorten my cross,
5 believe it or not, by not getting into too much detail
6 about specific technologies, what is on the horizon,
7 what have you, because I think that will be more
8 appropriately dealt with by witnesses that we might be
9 able to present, and I understand other parties may
10 have some questions on that, in any event.

11 Q. I would like to look at the thrust,
12 the elements that have shaped your approach and the
13 broad constraints on your approach at this time.

14 Can we go through these then, and the
15 first one begins:

16 Energy saving and energy producing
17 options are different from a financial
18 point of view. Investment in energy-
19 producing options results in assets owned
20 by the utility that will earn revenue to
21 pay off their cost.

22 Won't conservation investments earn
23 revenue? You will recover your expenditure in rates?

24 MR. SHALABY: A. Revenue here, yes, the
25 next line says, benefits of energy saving options go to

1 participating customers, and the utility receives no
2 revenue to pay off its grants.

3 Q. Well, you will have to raise rates
4 and receive revenue to pay off the grants; won't you?
5 The money doesn't materialize from nowhere.

6 A. Yes.

7 Q. Customers, on balance, will pay for
8 this?

9 A. Yes.

10 Q. All right. But the point here is
11 that the participating customer receives the most
12 direct return on that investment. That's the point
13 being made by this bullet.

14 We have talked about program design which
15 tries to match cost and benefits. You would agree that
16 that can mitigate that problem?

17 Ms. Fraser, I think it was you who
18 agreed.

19 MS. FRASER: A. You are talking about
20 the non-profit housing program or the T8 lights? Yes.

21 Q. I am talking about generally. You
22 can -- actually, I think it was you, Mr. Harper. I
23 apologize, Ms. Fraser. There is no reason we can't
24 take residential conservation costs and charge them to
25 the residential class of customers to better match

1 costs and benefits.

2 MR. HARPER: A. I agree you could better
3 match them. I don't think you can match them 100 per
4 cent, otherwise you would be charging that incentive
5 back to the specific customer and he would be no better
6 off than he was to begin with.

7 Q. Except that he would be able to,
8 through Hydro's largess, finance the investment at
9 5-1/2 per cent real or 5 per cent real and spread it
10 out over the full benefit life of the investment just
11 as you do with supply; right?

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1 [10:49 a.m.] A. Yes. That would be the only
2 advantage to this.

3 Q. All right. So, in fact, we could
4 even match it up on a one-to-one basis, although that
5 may be not worth the administrative cost in cases of
6 small measures.

7 A. I think not only not worth the
8 administrative cost, I think it would significantly
9 impact on the amount of induced EEI that you would
10 actually obtain.

11 Q. Right.

12 MR. BURKE: A. Well, I would like to add
13 that essentially what you are talking about now is a
14 long-term loan at a fixed real rate of interest and
15 effectively not talking about the incentives in the
16 form of grants anymore, so that the issue which you
17 seem to be pursuing about incentives and what
18 proportion of incentives we are paying wouldn't arise
19 anymore.

20 Q. In that extreme example where you
21 broke it down and charged the individual customer for
22 the individual measure, what you are saying is it would
23 be analogous to a long-term loan?

24 A. Yes.

25 Q. That would get us past the short

1 payback period problem that customers face?

2 A. It wouldn't, but it provide quite the
3 same reduction in front-end cost to customers and so
4 on.

5 Q. All right. And just getting back to
6 the point you have made here, you are not saying that
7 these conservation investments aren't assets.

8 MR. SHALABY: A. No, we are not saying
9 that.

10 Q. All right. And say I am a new
11 factory coming to Ontario and I locate and I add a
12 chunk of new load growth. If Hydro, in a given period
13 of time, faces a marginal cost of supply that is higher
14 than its embedded average cost, that will cause
15 everyone's rates to go up, won't it? Mr. Burke, you
16 are nodding. That is a yes?

17 MR. BURKE: A. If I have understood your
18 example, yes.

19 Q. All right. You don't charge that
20 particular customer the particular costs of the
21 marginal investment you are required to make on the
22 supply side?

23 MR. SHALABY: A. No. We charge average
24 rates. We said that.

25 Q. Yes, okay. Now, your concern about

1 the revenue stream, and I take it we have now sort of
2 gleaned that it is really this concern about fairness
3 or equity, there is no magic number, right? On 50 per
4 cent incentive, the problem still arises, does it not?

5 A. Yes.

6 Q. You go on and say in that paragraph:

7 Full grants can result in higher
8 electricity prices.

9 At page 43 of this exhibit, there is a
10 bit of a discussion at the bottom. It is helpful in
11 some respects. It says:

12 A diverse range of programs will
13 provide most customers with the
14 opportunity to participate in demand
15 management programs. This is desirable
16 for customer equity reasons.

17 Because the strategy allows incentives
18 that are likely to increase electricity
19 rates above the level they would have
20 been with the most economic supply
21 options, all customers including
22 non-participants will pay extra for
23 demand management programs that benefit
24 the participants in the programs.

25 That is not entirely accurate, is it, Mr.

1 Shalaby? All customers won't pay extra.

2 A. What is the source of inaccuracy, Mr.
3 Poch?

4 Q. Well, everyone's rates might go up,
5 but their bills on average will go down and for
6 participants, in particular, will assuredly go down.

7 A. That is correct, yes.

8 Q. All right.

9 A. But everybody will pay more per
10 kilowatthour.

11 Q. Yes. And on average, everyone's
12 costs will go down. You are doing it because it is
13 cost effective versus supply.

14 A. Yes.

15 Q. All right. And what you are saying
16 is, there is a risk that non-participants might get a
17 higher bill if rate design isn't carefully developed or
18 program design isn't carefully developed; is that the
19 concern?

20 A. Yes.

21 Q. All right. Now, isn't that the same
22 concern behind the non-participants test, the no losers
23 test that you supposedly swore off?

24 A. It is similar to it, yes.

25 Q. First of all, EPTAP equated that with

1 the no losers test, didn't they, and the reference is
2 in our materials, Volume 3 at page 17.

3 I will read this in, Mr. Chairman. It is
4 at page 17 of our evidence, page 25 of Exhibit 68:

5 If a conservation measure is as
6 effective at reducing demand as a new
7 resource option would be at increasing
8 capacity, we see no reason why Hydro
9 should not be prepared to pay the full
10 price for it.

11 Hydro's strategic principles indicate
12 a willingness to pay up to the full
13 avoided cost for each conservation
14 measure but still voice concern about
15 potential inequities to customers if
16 rates increase because of conservation.
17 This reference is to the no-losers test,
18 which is discussed in Appendix B.

19 You will recall in Appendix B, we already
20 looked at it once, where we had those different
21 scenarios for a hypothetical utility.

22 So, EPTAP rejected that kind of a
23 constraint, something that they call "a no-losers
24 test"?

25 MR. B. CAMPBELL: I am sorry, Mr.

1 Chairman. I don't think -- because of the way some of
2 this is spread out throughout this exhibit, Mr. Poch
3 referred to a paragraph yesterday, paragraph 2 on page
4 3, dealing with this topic as well. And I believe it
5 would only be fair to the witnesses to give them, given
6 that they only have segments of the document, they have
7 really got to look at the way this was treated
8 generally by EPTAP as well, which, as I say, Mr. Poch
9 referred to in paragraph 2 of page 3. And I think it
10 is fair that the witnesses be referred to that
11 reference as well--

12 MR. D. POCH: Yes.

13 MR. B. CAMPBELL: --when dealing with
14 that because it deals very specifically with EPTAP's
15 view of this problem.

16 THE CHAIRMAN: Well, page 3 of this
17 exhibit, you are talking about?

18 MR. B. CAMPBELL: Yes, Mr. Chairman.

19 MR. POCH: Yes. That is the excerpt --

20 THE CHAIRMAN: Technically, that is not
21 the view of the OEB. That is a study that is attached
22 as an appendix to the OEB report.

23 Now, I don't know because I haven't
24 looked to see what role that appendix plays, but that,
25 I think it should be noted, that page 3, which is B-4,

1 is a study - I forget who it was by - but it was --

2 MR. D. POCH: I can help, Mr. Chairman.

3 First of all, the report is EPTAP, not the OEB. The
4 appendix is a piece that is credited to James
5 Litchfield and he was one of the EPTAP -- I think there
6 were five EPTAP commissioners.

7 THE CHAIRMAN: Well, all I am really
8 saying is I don't know how that particular appendix
9 fits into the EPTAP proposals because I haven't really
10 read them.

11 MR. B. CAMPBELL: I had understood when
12 Mr. Poch took us to the reference for this question, it
13 was to EPTAP material and I have now successfully lost
14 my page reference.

15 MR. D. POCH: Page 17 of our materials.

16 And Mr. Chairman, you are quite correct,
17 page 17 that I am referring to is from the body of the
18 EPTAP report itself.

19 THE CHAIRMAN: Well, I have lost track of
20 the question.

21 What is the question?

22 MR. D. POCH: I was pressing the panel to
23 agree that EPTAP took a dim view of this approach, but
24 I think I won't bother pressing them. I think EPTAP's
25 report speaks for itself and we have dwelled on it. I

1 think it is fairly obvious that we have dwelled on it
2 enough.

3 Q. If we can go back to the list of five
4 reasons in Exhibit 74 at page 47. Again, on the first
5 one, you talk about assets owned by the utility. I
6 don't know why that is mentioned. I can't understand.
7 But if that matters for any reason --

8 MS. FRASER: A. If I could interject
9 here?

10 Q. All right.

11 A. I think it matters because it has to
12 do with the longevity of the asset and the uncertainty
13 with respect to longevity of the asset. When we own an
14 asset, we can take care and feed it properly and all
15 those sorts of things.

16 If the asset is spread out over, you
17 know, millions and millions of square feet and that the
18 lights could be pulled out, other ones put in. I think
19 there is a concern there with respect to uncertainty
20 that has to be addressed.

21 Q. It may not work for all these assets
22 but there is no reason you couldn't treat them like
23 Bell Canada at least used to treat telephone receivers,
24 could you? Have it belong to Bell, have the phone
25 store, you would have the light bulb store, whatever it

1 is. It would belong to you, it would be understood by
2 all?

3 A. Well, that is a thought.

4 Q. All right.

5 MR. BURKE: A. I would just mention that
6 the demand management programs cover nearly every
7 aspect of life in Ontario. It is quite an extreme
8 proposition if you really followed it through.

9 Q. All right. We might agree this
10 wouldn't be pleasant or indeed appropriate or necessary
11 for a number of options, right?

12 A. Well, Ontario Hydro might, just to
13 take this to an extreme, might end up owning the
14 envelopes of every house in Ontario and commercial
15 building or treating that as their assets.

16 Q. But when we are --

17 A. It takes things to an extreme.

18 Q. But when we are talking about
19 envelopes of buildings, this isn't a concern. The
20 envelope is not going to disappear. The customer is
21 not going to abscond with it or be with in a
22 replacement position at least in the near future,
23 right? It is not really a concern when we are talking
24 about envelopes of buildings?

25 A. Well, I think it is just a matter of

1 degree.

2 Q. All right. Let's go on to the second
3 point, the second group of reasons you offer:

4 "A full grant should not be necessary
5 to encourage cost effective options," and
6 you give examples of the Federal CHIP Program, which
7 had incentive levels at the 25 to 50 per cent range.

8 Now, let me be clear here with my
9 questions. It is not that we disagree. If it is not
10 necessary to pay up to 100 per cent to get the maximum
11 economic potential, I can't see why you would do it,
12 but should that observation limit incentives where it
13 is agreed that a higher incentive will either get more
14 DSM or provide a greater assurance of getting more?

15 MS. FRASER: A. No, it shouldn't and it
16 hasn't.

17 Q. All right.

18 A. It doesn't. And I talk talked about
19 the T8 lighting incentive and I talked about the
20 enhancement, the savings by design for new construction
21 where we will be paying the full incremental cost to
22 avoid lost opportunities. I have talked about the
23 non-profit housing program. We are paying not just the
24 full incremental cost but the full project cost because
25 I don't think we would ever find an opportunity to just

1 pay the incremental cost because those sorts of things
2 wouldn't happen in those kinds of buildings.

3 So, I think, as Mr. Shalaby pointed out,
4 that these principles apply on average to the total
5 demand management plan, but when we are looking at
6 specific programs and specific market places, we
7 certainly have the flexibility to look at exactly those
8 kinds of things and see where full incentives are
9 required. The window incentive is another example in
10 residential.

11 I think there is also another reason why,
12 let's say, paying up to full avoided cost, if that is
13 what it takes to pay the increment, if it is -- if they
14 are equal cost items, that you are only going to be
15 able to deal then with the one barrier and you have got
16 many more barriers to have to deal with.

17 So, you have got to keep a little bit of
18 that program cost for dealing with other barriers and
19 hopefully knocking down those barriers to the extent
20 that when the next energy efficiency opportunity
21 arises, that the customer can take advantage of it
22 without, you know, having somebody come in and saying,
23 'this is what you must do'.

24 Q. Are you saying that this strategy
25 element, which is a constraint out of a concern for

1 fairness, has been abandoned?

2 MR. SHALABY: A. Let me go to the end of
3 that section. It may cut a lot of discussion short. I
4 don't mean to interrupt. If we go to page 49 of
5 Exhibit 74, the second paragraph, the very last
6 sentence says:

7 The selection of the level of
8 financial incentives would require
9 careful balancing of the requirements of
10 the strategy elements 3.11.1 to 3.11.4.
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1 [11:03 a.m.] And if we go and read those four strategy
2 elements, they are on page 45, the discussion
3 throughout the four pages clearly shows that those four
4 requirements are in conflict. You cannot satisfy all
5 four simultaneously. You trade them off. You balance
6 them. Sometimes you go in one direction; sometimes you
7 go the other, depending on what the market segment you
8 are dealing with is and what the program is.

9 So, is there is no abandonment of
10 anything. There are four guidelines given on page 45.
11 One of them, for example, says "Incentives should be
12 high enough to encourage a development of a large part
13 of the potential."

14 Q. It doesn't say maximum; it doesn't
15 say all; does it?

16 A. All what?

17 Q. All of the potential.

18 A. Well, "Incentives should be high
19 enough to encourage a development of a large...." --
20 no, it doesn't say all the potential.

21 And for example in the non-profit
22 housing, that particular strategy element was dominant.
23 People who designed programs decided that to get a
24 large part of that potential you have got to go a long
25 distance with incentives.

1 Q. Mr. Shalaby, I think we agree, you
2 have just told me there is a balancing that goes on.

3 A. That's exactly what happens.

4 Q. That these different strategy
5 elements each give a little.

6 A. You read the four together, you look
7 at the program you want to implement, you exercise
8 judgment, and you balance the different factors and you
9 go ahead with the different --

10 Q. So, the strategy element concerned
11 with acceptable levels of incentives, that constraint,
12 customers must provide a substantial contribution does
13 play a role, you are agreeing with me?

14 A. It does play a role. But it may be
15 superseded by another strategy element that says,
16 'Incentives should be high enough to encourage a
17 development of a large part of the potential.'

18 Q. In some cases it's superseded, in
19 some cases there is a saw-off, there is a balancing, as
20 you have said; right?

21 A. That is right.

22 And if it's to the detriment to the
23 program it is not dominant. We are not going to insist
24 that customers pay a large part if that becomes the
25 death knell of that program. We don't do that. We are

1 not going to insist stubbornly that people pay half the
2 cost if we know that will kill the program. We don't
3 do that.

4 Q. Let's not talk about the extreme case
5 where it would kill the program; let's just talk about
6 where you would get a little less out of respect for
7 that strategy element, Ms. Fraser.

8 If you do that, to the extent you scale
9 back DSM, first of all we agree you will have to
10 escalate your supply plan?

11 MS. FRASER: A. Well, I don't think we
12 are doing that.

13 MR. SHALABY: A. I think I made that --

14 MS. FRASER: A. We are planning on the
15 basis that we are going to achieve all those things.

16 Q. If you have, out of respect for that
17 strategy element, not gotten the full economic
18 potential, even if you have gotten 95 but not 100 per
19 cent of it, to the extent that you have compromised
20 your 100 per cent out of respect for that strategy
21 element, we are going to see more supply? You are
22 going to have a gap to fill?

23 MR. SHALABY: A. Yes. I agreed to that
24 yesterday.

25 Q. And indeed you have told us you are

1 only going to get 30 per cent attainment, so --

2 MS. FRASER: A. By the year 2000.

3 Q. Right.

4 MR. SHALABY: A. It doesn't follow,
5 though, that relaxing the strategy element will give
6 you 100 per cent attainment.

7 Q. No, I wasn't suggesting you get 100
8 per cent. But to whatever extent that we have seen a
9 change, on balance.

10 MS. FRASER: A. If I could provide a
11 couple of examples here.

12 Q. Well, if I may interrupt. I have
13 heard your examples. I hear that in some cases--

14 A. I've got a new one.

15 Q. --you are providing 100 per cent. I
16 appreciate that. I acknowledge that.

17 THE CHAIRMAN: You don't want to hear the
18 new one? (laughter)

19 MR. D. POCH: Just what I was going to
20 say, Mr. Chairman.

21 MS. FRASER: We have been giving away
22 free showerheads for multi-residential buildings and
23 hotels and motels for over two years now. We have
24 given away over 50,000 of them. That is not full
25 saturation, although we give them to them, we deliver

1 them to them. All they have to do is take them and put
2 them on, give us back their old ones, so we know that
3 the other ones don't end up at a flea market somewhere,
4 and that's nowhere near full penetration. Yet, the
5 full cost is there outside of, you know, screwing it
6 on.

7 The flip side is the street lighting and
8 we talked about it in great detail so I won't talk
9 about that. But, you know, 25 per cent of the project
10 cost and of the pilot facilities, we are now up to 93
11 per cent take-up.

12 So, I think it's a balancing act and I
13 think it's something that we don't have all the answers
14 for yet, that's for sure, and we are still learning and
15 we are still, you know, fine-tuning incentive levels
16 and looking at the various rules that we are using.

17 We are going to keep doing that until we
18 get all that we can. If we can get more than, you
19 know, going back to the 2000 by 2000, we would get more
20 than that if we could and we, you know, can keep
21 working at it to make it happen. And with the prospect
22 of aggressive standards by the provincial government
23 and the fuel switching, I think we can see those things
24 happen.

25 MR. D. POCH: Q. Thank you.

1 Would you agree that to the extent that
2 you get any less DSM in any of your programs because
3 any notice at all has been taken of this strategy
4 element, you have already agreed that that would mean
5 more supply and by definition that would mean more
6 expensive supply because we are talking about
7 sacrificing economically attractive DSM. So, isn't
8 this sort of like an all-losers test? That is, if we
9 don't get 100 per cent of the economic DSM, we all
10 lose?

11 MS. FRASER: A. Yes. And I think the
12 only issue, once we have agreed to that, is then what
13 is a reliable number for planning purposes. And those
14 I think are two very different things.

15 Q. And just in terms of this, both part
16 participants and non-participants lose in that
17 scenario?

18 A. Yes.

19 Q. So, can I take it from this and the
20 comments you have just made that this reasoning behind
21 this strategy element that is offered up in that point
22 in the five points, shouldn't be allowed to limit DSM
23 incentives anywhere it might matter; it only applies
24 where there is assuredly nothing to be gained from a
25 higher incentive? Or it only should be applied where

1 there is assuredly nothing to be gained from a higher
2 incentive?

3 A. I would agree. I would just caution
4 that there is still a lot of things we don't know and
5 still a lot of things that lots of other utilities
6 don't now about the relationship between incentives and
7 participation.

8 Q. So, there may not be many cases where
9 you can be assured that a higher incentive wouldn't
10 help, is what you are telling me, with the state of
11 knowledge today?

12 A. Or that a lower incentive wouldn't
13 work, exactly.

14 MR. SHALABY: A. Perhaps there is
15 another area to consider here: is that what you are
16 saying applies if you have infinite amount of money.
17 If you don't have infinite amount of money, is it more
18 preferable to get 80 per cent in two areas by moderate
19 incentives or do you spend all your money to get 90 per
20 cent in only one area?

21 Q. I guess I have the same problem with
22 that point that I had with Ms. Fraser's comments to Ms.
23 Couban about waste. We are not talking here about
24 buying any measures that aren't cost effective against
25 supply, are we?

1 A. But the costs of getting the last
2 little bit of a measure could be considerably higher
3 than getting the first little bit.

4 Q. Can we agree then --

5 A. Not all showerheads cost the same to
6 retrofit. Some are easier to get at; some are more
7 expensive to get at.

8 Q. Can we agree for our discussion, and
9 from here on in I am happy to take as a caveat when I
10 am talking about going after 100 per cent of economic
11 potential, I am assuming that the last measure you
12 install is still economic, with all the costs
13 associated with it. And Mr. Burke, I see you are
14 nodding. I am sure that's how you have done your
15 economic potential. That's economic dispatch; right?

16 MR. BURKE: A. Yes.

17 MR. SHALABY: A. This still says that
18 the first one is a lot cheaper to get than the last
19 one.

20 Q. Yes.

21 A. Remember the non-linear term?

22 Q. Yes.

23 A. That's what that is.

24 Q. And indeed doesn't that say the level
25 of incentives and the ability to overcome barriers and

1 the willingness of the utility to pay is even more
2 important for that last measure competing with supply,
3 the 2000th megawatt by 2000, than it is for the first
4 one? Or the 2001st megawatt, let's say, because it's
5 even more expensive, even less likely to happen on its
6 own?

7 A. It may be more crucial for the
8 utility to intervene at that stage.

9 Q. Yes.

10 A. But the point I started making is if
11 you have a limited pool of resources it may be wiser to
12 spend it to get substantial penetration in two measures
13 than to get complete penetration in only one measure.

14 Q. Where does this limited pool of
15 resources, where does that constraint arise from?

16 A. You talked about common sense, didn't
17 you.

18 Q. Well, yes, I did.

19 A. We don't have infinite amount of
20 money. Our customers don't have infinite amount of
21 money to spend.

22 Q. But we are only talking about
23 spending less than you have otherwise agreed you will
24 commit to supply. We are not talking about going
25 beyond that budget, are we, Mr. Shalaby, in any of

1 this?

2 A. Going...?

3 Q. Beyond that total customer cost.

4 A. No, we're not. We're not, but the --

5 Q. So, there is no constraint in terms
6 of monetary resources being able to be brought to bear
7 here. If it is, then it applies equally well to
8 nuclear plants, doesn't it?

9 A. Well, we don't build nuclear plants
10 that we don't need either.

11 Q. Absolutely. And aren't we agreeing
12 we are only talking about 100 per cent of economic
13 potential to displace supply that you will otherwise
14 need, you will otherwise build?

15 A. No. If we attain 100 per cent of the
16 potential, that would be far in excess of what we need.

17 Q. Okay.

18 A. So, we don't have resources to obtain
19 100 per cent of potential over the next five years. We
20 don't have that kind of resource.

21 Q. And.

22 A. Nor do we need it, nor do we plan to
23 spend it on supply.

24 Q. So what you are really saying is your
25 goal is not 100 per cent, your goal is something like,

1 in the optimal world, the 80 per cent we heard you you
2 needed, for example, to avoid supply. We are talking
3 about to the year 2000 and let's all acknowledge again
4 that that is just a talking point.

5 That's really your goal and you don't
6 see, even though it's cost effective compared to your
7 avoided cost which presumably then would just be
8 running some plants or taking some coal plants out of
9 retirement, whatever it is, you don't see any need to
10 go beyond that? You see a resource constraint in going
11 beyond that?

12 A. It is cost effective as long as you
13 need it.

14 Q. Right.

15 A. Now as the ---
16 ---Loud noise.

17 MR. D. POCH: Q. Sorry, Mr. Shalaby, go
18 ahead.

19 MR. SHALABY: A. I need an hour break to
20 recover from that. (laughter)

21 Q. You were saying it's cost effective
22 as long as you need it and perhaps we are talking at
23 cross-purposes here. I had understood that the
24 definition of the economic potential was that it's both
25 cost effective and you need it. If you didn't need it,

1 it wouldn't be cost effective.

2 A. That's exactly right.

3 Q. It wouldn't be economic potential?

4 A. That's the point I am making.

5 And as you approach the amounts you need,
6 the avoided costs will drop. If you don't need
7 something, you are not prepared to pay anything for it.

8 MR. BURKE: A. I think I should just
9 clarify one point here. The screening of measures that
10 are included in the induced potential is against
11 avoided cost, presuming that you need it, but it may
12 not be the case that you need all of the measures that
13 exist in that induced potential; that is, it could be
14 that the system goes into surplus well before you
15 achieve full potential, at which case the avoided costs
16 are much lower than the ones that were originally used
17 for screening, which is why you talk about an
18 integrated resource planning process that would circle
19 through this and find this out as you moved along.

20 The potential numbers do not give you a
21 blank check on economic demand management. They give
22 you the first round before you then check for whether
23 or not the system still requires what you are
24 obtaining.

25 Q. And I take it that your comments hold

1 true for supply. In that scenario if we found that,
2 for example, a load forecast had fallen, there isn't as
3 much need, we would want to scale back either on DSM or
4 on supply plans?

5 A. That's correct. I think that's what
6 integrated resource planning is about.

7 Q. Okay. What about, and we touched on
8 this a moment ago, what about if 100 per cent
9 penetration of a measure would assuredly occur without
10 100 per cent of incremental cost incentive, but it
11 turns out it is cheaper for Hydro to do it because of
12 it preferential access to capital and economies of
13 scale, and what have you, wouldn't that be a case where
14 if it wasn't an intrusive act or unduly intrusive act,
15 we would be enhancing customer satisfaction and
16 economic gain for the province by having the utility
17 pay for the measure or include it in a program?

18 MS. FRASER: A. Can you run through that
19 again.

20 Q. Let's say there is a measure of which
21 you are confident. Mr. Burke tells you it's in his
22 natural EEI forecast, it's going to be taken up, no
23 problem, you don't need to inspire any more of this
24 with incentives, all that should happen will happen.

25 But on analysis it turns out it's a

1 measure you can include in a package of, I don't know,
2 house sealing measures or something that you are going
3 to be out there doing, and your analysis shows that if
4 Hydro does it at the same time they are doing the other
5 house sealing measures, it's cheaper than what it would
6 cost the customer, either because of economies of scale
7 or because of your access to capital, what have you.
8 Wouldn't that enhance customer satisfaction?

...

1 [11:20 a.m.] A. We would probably include that in our
2 program. I think under the way we would do that now we
3 certainly would.

4 What would happen is, after all is said
5 is done and we looked at those results, we would have
6 to separate out those which were in the basic load
7 forecast which are those that would be subtracted from
8 the basic load forecast, that's all.

9 Q. There would be 100 per cent free
10 riders, but everybody would be happy to be doing it
11 anyway.

12 A. Yes.

13 Q. Okay. It wouldn't change the need
14 for supply because it would have been in the natural if
15 you didn't do it; that's all you are saying.

16 MR. BURKE: A. The way I have always
17 thought of it, Mr. Poch, is that if that situation
18 arose, the customer would pay for the measure because
19 the benefit to the customer would be getting it at a
20 lower cost than he would otherwise have to pay were he
21 to do it separately or individually. That's the
22 benefit to the customer. We wouldn't expect Hydro
23 necessarily to pay for measures that would otherwise
24 occur.

25 It may turn out in delivering programs

1 that it's sort of almost not cost-effective to isolate
2 some of these things from the general package delivered
3 by the program and so it's not cost-effective to bill
4 the customer. But in principle I would think the
5 customer ought to pay and the only benefit is the mass
6 purchasing, or whatever, by Hydro that lowers the unit
7 cost.

8 Q. So, that would be an example where
9 you would design a program to more carefully perhaps
10 offer these items to customers at a reduced cost, offer
11 to install them while your people are in the house
12 anyway. Recognize that there is going to be 100 per
13 cent take up anyway, people are willing to pay, so they
14 would sign on the dotted line and it would
15 automatically get billed to them. You could avoid any
16 equity problem at all, you wouldn't have any hurdles;
17 all you would be doing is being helpful.

18 MS. FRASER: A. I would agree. But I
19 just would caution about paying 100 per cent and
20 getting 100 per cent take-up.

21 Q. Yes. I was posing that as a
22 hypothetical just so that it was clear.

23 All right, let's go on to the third
24 group which reads: It's own equitable that the
25 participating customer who receive the benefit of lower

1 electricity cost should contribute a substantial part
2 of the cost, otherwise grants may be seen as giveaways
3 of the customer's money.

4 Aren't their ways around this problem?
5 I think we spoke of these yesterday, EPTAP suggested a
6 couple of ways that we could minimize this equity
7 concern with good program design and matching, and so
8 on. We have spoken about it again today.

9 MR. SHALABY: A. Yes, and that's
10 confirmed on page 48 of that same exhibit.

11 Q. All right. And isn't this just again
12 a restatement of another version of the no-losers test?

13 A. It's a flavour of that, yes.

14 Q. Do you apply this test to limit
15 supply investments?

16 A. No. It's a meaningless test in the
17 supply case.

18 Q. Well, let's talk about impacts. You
19 don't insist on zero discharge or zero risk from supply
20 investments?

21 A. How is that similar to that test?

22 Q. It's a rhetorical question. You keep
23 the price of power down for some AMPCO member in
24 Toronto by not going whole-hog to limit emissions at
25 Pickering and Nanticoke to zero, so some kid living

1 next to Nanticoke or Pickering is getting exposed to
2 some risk, and it may not be cost effective to reduce
3 that in terms of society, but he is getting exposed to
4 some risk because the utility says it's crazy to spend
5 more money to reduce it, and the benefit of not
6 spending that money is going to the AMPCO guy in
7 Toronto who is getting cheaper power; right?

8 A. It's going to every customer in
9 Ontario.

10 Q. Right. In proportion to how much
11 power they use.

12 A. It is going to every customer.

13 Q. And it's not going to those customers
14 in proportion to how much risk they have been forced to
15 take on, is it?

16 A. I don't know that. It gets pretty
17 emotional when you put a kid beside a nuclear plant and
18 an AMPCO customer in Toronto.

19 Q. The real world is like that, Mr.
20 Shalaby.

21 A little less emotional then, Mr.
22 Shalaby. Patten Post, you have told us it's got a cost
23 benefit ratio of 1.2. Because of political
24 constraints, or whatever is at play, for whatever your
25 reason you are building that, it comes out to be

1 slightly more expensive than your avoided cost, we are
2 all going to pay for that.

3 A. Yes.

4 Q. Again, you let municipal utilities
5 charge heating customers, customers with a temperature
6 sensitive load as opposed to non-peak loads, you let
7 them charge them the same price for their power and
8 energy, if they are residential customers, even though
9 your avoided costs, since you have got something there
10 for capacity, tells us that it is more expensive to
11 serve that load; right?

12 A. Yes.

13 Q. So, there is a recognition that those
14 customers are getting service at greater value than the
15 average rates they pay and so other customers must be
16 taking that up; fair?

17 A. Yes.

18 Q. We have already spoken about how you
19 let new customers onto the system and if the marginal
20 costs of system expansion are different, we are all
21 going to help.

22 Have you gotten any flak from the free
23 fridge thermometer giveaway? Did anybody get upset
24 about that?

25 MS. MITCHELL: A. Upset in what sense?

1 Q. I gather no one got upset because you
2 can't even understand my question.

3 A. No, I understood your question. I am
4 just asking you to be more specific. In relation to
5 what?

6 Q. You haven't gotten a backlash from
7 other disgruntled customers from the conservation
8 programs you have done to date, that that's not fair,
9 that guy has got two fridges, he's getting an extra
10 fridge thermometer?

11 A. I wouldn't say we have had a
12 backlash, no.

13 Q. And you haven't any upheaval about
14 the \$5 grants you are sending out to people who bought
15 the light bulbs at Loblaws? Did you get any flak about
16 that from anyone?

17 A. Again, I am not clear as to what you
18 are referring to as people being upset. What
19 specifically are you asking?

20 Q. We are told there is concern about
21 customer equity here and I am just wondering if that
22 concern has been evidenced in public reaction to these
23 programs.

24 A. Not with respect to the equity issue.
25 On the Loblaws compact fluorescent promotion, there

1 might be termed some backlash with respect to
2 availabilty of the bulbs.

3 Q. People got upset because there just
4 weren't enough bulbs to be had; right?

5 A. Yes. But that's not the same as the
6 equity issue that you were referencing.

7 Q. No, not at all.

8 In fact, that's the concern of
9 non-participants who want to be participants; right?

10 A. That's right, and we are happy that
11 they do want to be.

12 Q. Aren't we all.

13 MR. SHALABY: A. There was not the flak
14 with respect to equity because the program was designed
15 that a participant pays a substantial cost of the
16 measure. It's exactly because of the measure the
17 program was designed where the participate pays
18 three-quarters and the utility pays a quarter,
19 somewhere about that.

20 Q. We will come back to that.

21 A. Now, if people were handing out light
22 bulbs, \$20 light bulbs at Loblaws, maybe there would
23 have been a backlash.

24 Q. Let's test it right now. You have
25 got a program for farmers for energy efficient bulbs -

1 I am not sure if you are hatching bulbs or what kind of
2 bulb they are - where you went to 100 per cent
3 incremental cost incentives; am I correct?

4 We will come to this later, but my
5 recollection is because you felt that was the best way
6 to get take-up, it was going to be necessary in the
7 circumstances. Does this ring a bell?

8 MS. MITCHELL: A. I believe we have a
9 farm lighting program which is part of the commercial
10 program, that is a coupon program. I don't believe it
11 covers the full incremental cost. However, I can check
12 that.

13 Q. I promise to come back to this with
14 the cite when I get to it in my notes, I just can't
15 find it, we will discuss it at that time.

16 Isn't this concern about equity something
17 that you can ameliorate significantly if you explain to
18 customers and to ratepayers generally that you are
19 investing in these measures precisely because they are
20 cheaper than supply, more environmentally benign, they
21 reduce everyone's health risk, what have you, whatever
22 benefit you can ascribe to it, don't you think that
23 will, in general, make people feel good about all this?

24 MR. SHALABY: A. Mr. Poch, I already
25 mentioned that page 48 states exactly that. It says,

1 let me read it, because I mentioned it before. It
2 says:

3 Concerns about inequities can be
4 reduced by careful implementation of
5 demand management.

6 We are identifying it's a concern when we
7 are agreeing with you that it could be mitigated.

8 MR. D. POCH: Mr. Chairman, I am about to
9 turn the fourth item on the list, perhaps it would be a
10 good time to break.

11 THE CHAIRMAN: We will adjourn for
12 fifteen minutes.

13 ---Recess at 11:30 a.m.

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...

1 ---On resuming at 11:48 a.m.

2 THE CHAIRMAN: Please be seated.

3 MR. D. POCH: Mr. Chairman, I understand
4 Mr. Burke has some information that might alleviate the
5 need for one of the undertakings.

6 MR. BURKE: That's correct. I think the
7 undertaking, and I will just get the exact number
8 here -- 267.3, where it says, "Ontario Hydro undertakes
9 to provide the electrical clothes dryer load both
10 present load and in the load forecast" - at least that
11 is what it says here -- was actually supplied in a
12 previous transcript undertaking prepared by Dr.
13 Buja-Bijunas for Panel 1. The number of that
14 undertaking was 134.29. It says "revised" in brackets.

15 And that undertaking actually lists all
16 of the elements of the other category for the
17 residential sector for which we prepared the spread
18 sheet-type forecast that I was mentioning yesterday and
19 it includes specifically clothes dryers.

20 MR. D. POCH: Could you be so kind just
21 to read into the record the clothes dryer numbers
22 there?

23 MR. BURKE: The clothes dryer load for
24 1990 is estimated at -- this is in gigawatthours now.
25 I will do it in terawatthours and maybe that is

1 easier - 1.8 terawatthours in 1990, 2.1 terawatthours
2 in the year 2000 and 2.3 terawatthours in the year
3 2015. That is the total electric clothes dryer load in
4 Ontario.

5 MR. D. POCH: Q. All right. If we could
6 turn to Exhibit 74, page 47, the fourth reason you
7 offer up as a reason in support of this strategy
8 element limiting incentives, you say:

9 If customers who participate in a
10 program do not make a significant
11 contribution to the equipment or system
12 to be installed on their premises, they
13 will not develop an 'ownership' or a
14 commitment to the option.

15 And then you say:

16 U.S. experience with energy
17 management programs has shown that
18 equipment bought entirely by incentive
19 payments is often not used.

20 First of all, what was the U.S.
21 experience you are referring to there with respect to?

22 MR. SHALABY: A. I don't have specific
23 knowledge of that.

24 Anybody else?

25 MR. WILSON: It would appear that none of

1 us have the specific knowledge you are looking for.

2 Q. Could we get that as an undertaking
3 that you would provide us with the information behind
4 that suggestion?

5 A. We will make that attempt.

6 THE CHAIRMAN: Number?

7 MR. NUNN: Well, that could be 267.3 or
8 4. Did you just erase 267.3?

9 THE CHAIRMAN: For continuity, you
10 probably should give it a new number.

11 MR. NUNN: 267.4.

12 MR. D. POCH: Thank you.

13 ---UNDERTAKING NO. 267.4: Ontario Hydro undertakes to
14 attempt to provide the information behind
15 the suggestion in support of the strategy
element limiting incentives.

16 MR. D. POCH: Q. Let's just examine that
17 point briefly. If a customer gets, say, a \$200, 95 per
18 cent high efficient motor instead of an 80 per cent
19 efficient motor - I gather the numbers are probably
20 closer together than that in real life - and the
21 incremental cost of the extra efficiency adds \$50 to
22 the motor cost, if you paid 100 per cent incentives,
23 the customer would still have to put out \$150 of the
24 \$200, right, that is, the cost of the standard measure?

25 MS. FRASER: A. Yes, the incentive was

1 based on the incremental cost. I think this is a
2 perfect example where differentiating the products in
3 the market is critica. Once you have, say, incented a
4 manufacturer, for instance, to put a high efficiency
5 motor in a packaged ventilation system or whatever, it
6 is very doubtful the customer is going to pull it out
7 just because you paid for an increment of it.

8 On the other hand, if it is a situation
9 where you might, for example -- you could do like B.C.
10 Hydro is doing. They are paying, I believe, \$100 for a
11 programmable thermostat which costs about \$80 in total
12 and the customer can stick it on the wall and salute it
13 every day and that is about all the use you might get
14 out of it. I think it is important to understand
15 exactly where you are doing it, and I think this is a
16 perfect example where if that rule doesn't fit, we
17 don't use it.

18 Q. So, what you are telling me is that
19 it is not really a concern where we are only talking
20 about incremental cost and there is a standard cost
21 that the customer is going to pay regardless, right?

22 A. Yes. I think it is when you are
23 going in and putting something that can be easily
24 overlaid over the customer's premises, as I think
25 control systems and occupancy sensors and things like

1 that, is one area where we do have some concerns about
2 the longevity and the ability of the customers to
3 override them and so we are working at ways to deal
4 with that.

5 But in terms of incentives, I think it
6 would just be so much easier if something didn't work
7 "oh well, I haven't paid anything for it anyway, so
8 what the heck, get rid of it."

9 So, I think that is a perfect example, I
10 think, of what Mr. Shalaby was saying of using an
11 umbrella guidance in terms of the overall plan is very
12 different when you get down to program specifics.

13 Q. Most measures, and we have heard Mr.
14 Burke speak about this at length, most measures are not
15 actually self-contained little efficiency technologies;
16 they are improvements to technology and use out there
17 and you are going to intervene at the point where there
18 is going to be a stock turnover or renovation or what
19 have you and push people the incremental step; is that
20 fair?

21 A. Hopefully, yes, that is what we will
22 do.

23 Q. So, this really doesn't apply then in
24 most cases because the customer will, in most cases, be
25 making the investment up to the standard measure cost

1 anyway?

2 A. That is true with the exception, I
3 think, of some things. But even with some things that
4 you might think are not self-contained, for instance,
5 energy saving fluorescent tubes. When we started with
6 the audits for the federal government, they said, oh,
7 no problem, we have changed all our facilities to 34
8 watt tubes. There is no way you are going to find a 40
9 in any of our buildings.

10 Guess what we found in lots of their
11 buildings, because the purchasing department places the
12 order and they look at the cost of the two of them.
13 And even though they had "made a policy decision", that
14 is not what was in their buildings.

15 Q. So, that is another distinction then.
16 So first of all, if we have what I can call 'harder
17 measures', things like better furnaces or building
18 shell improvements or something, they are not going to
19 walk away or not be replaced. They just don't great
20 replaced. They have great longevity.

21 A. That's right, and we recognize that,
22 for instance, in the commercial lighting program. We
23 pay more for a hard-wired compact fluorescent than one
24 that is a screw-in one.

25 Q. Right. And again, because that way

1 the customer will only have the option of replacing the
2 bulb with the one that fits the new socket.

3 A. Right. It would be tough.

4 Q. And the same with the T8 system,
5 right?

6 A. Exactly.

7 Q. All right. And in the case of less
8 permanent or less -- just by the shape of the
9 technology, in the case of examples where you can't be
10 assured because of the shape of the socket or the
11 longevity of the product that a replacement wouldn't be
12 a replacement with the standard technology, isn't the
13 answer to that to intervene at the distributor channel
14 level and try to change the standard stock or change
15 the price of replacement tubes or what have you so that
16 it is just as cheap or cheaper than the old inefficient
17 standard that may still be on the shelf?

18 A. Yes. That is why we have a
19 distributor incentive for motor program and that is why
20 we are looking at the distributor side of the lighting
21 program, so, yes--

22 Q. And you gave the example --

23 A. --consideration.

24 Q. Sorry. And you gave the example of
25 the B.C. Hydro case where they are actually paying not

1 just an incremental cost because people don't replace
2 the thermostats that often, I guess; they are going out
3 and paying the full measure cost plus a further
4 incentive.

5 A. It seems to be, yes.

6 Q. All right. And I take it that they
7 have justified that as being cheaper than the avoided
8 cost of supply?

9 A. I guess they have.

10 Q. First of all, have you looked at in
11 such a case or in the case of any of the examples we
12 have spoken of, if there is a residual problem - that
13 is, some percentage of customers out there just don't
14 know what is good for them and it won't matter how well
15 you educate them to why they are going to save by using
16 their energy efficient thermostat they are going to
17 save on their electric bill and so on - assuming there
18 is some percentage of them, for whatever reason and
19 maybe for good reason, a sick child in the home and
20 they don't want the temperature to go down at night in
21 case the kid kicks off his blankets, have you studied
22 that that residual slippage is likely to lose you so
23 much that it is worth going for this less than 100 per
24 cent to get customer buy-in and in the process perhaps
25 losing penetration, generally, to some extent? Have

1 you looked at that trade off?

2 A. Not in a great deal of statistical
3 analysis. At this point we don't have enough
4 experience and I don't think any utility has enough
5 experience to that do.

6 Q. Okay. Let's go on to the fifth point
7 where you speak of you wouldn't want to introduce
8 unwanted market distortions, and you give an example -
9 I think we have seen this example before, large
10 incentives for improved insulation and new
11 electrically-heated houses could inch increase the
12 market share of electricity. People would opt for
13 electric heating because they can get this program when
14 they may not be able to get it with gas and the net
15 effect of increasing electricity demand likely will be
16 considered unfair marketing practices by the gas
17 companies.

18 First of all, this is only an issue where
19 we aren't - that is, are not - talking about
20 electricity specific uses, right? Mr. Burke?

21 MR. BURKE: A. If no one else want wants
22 to answer - yes, I guess you would have to say there is
23 a concern about market share and, therefore, it clearly
24 would be in a case where electricity was competing with
25 other fuels.

1 Q. Right. And second - I think we have
2 already touched on this - you could avoid the result in
3 your example of customer switching to electricity to
4 get the benefit of subsidized R2000 home by either
5 limiting the program as you have done to areas where
6 gas isn't available, or you could enhance the result by
7 going to a cooperative approach where there is no
8 lesser incentive to put R2000 in a gas home. I think
9 we have agreed to that, too.

10 Couldn't you also try to control abuse in
11 some cases, perhaps not the R2000 case, if you paid the
12 full shot? If you paid the full shot, might not
13 customers be prepared to put up with a little more
14 questioning and screening so you could be assured you
15 weren't paying for too many inappropriate participants
16 or free riders?

17 MS. FRASER: A. I am not sure that that
18 principle applies to the idea of paying for free
19 riders.

20 Q. Okay, leave aside the free riders -
21 inappropriate participants. If you paid more, you
22 might be able to get away with more intensive screening
23 at the customer level, fair?

24 A. That is possible. It is an issue for
25 program design as you have said.

1 I think in terms of distortion in the
2 marketplace, we might be looking at something more in
3 terms of where if we started paying 100 per cent of the
4 incremental cost as a matter of policy, that you might
5 see that incremental cost start to increase rather than
6 decrease the way we have seen it so far.

7 The research that we have done on the
8 lighting program which indicates that people are
9 satisfied with the lighting incentives also indicated
10 that the allies were concerned that the issue of
11 competition - these are the contractors who go in and
12 and bid on retrofit jobs - that competition would be
13 wiped out in the marketplace because Hydro would be
14 paying the full price, and that the other non-price
15 elements that they might be including in their bid
16 would get lost in terms of more value-added service,
17 actually maybe better lighting design, a better product
18 and so on would get sort of washed out.

19 And so, when we entertained the idea of
20 full incentives or even higher incentives than we have,
21 the lighting industry basically asked us not to - that
22 was manufacturers and contractors. And so what we have
23 done instead is - not necessarily instead, but partly
24 because of that - is to design our lighting incentives
25 such that those things that provide the most benefits

1 and the longer lasting benefits we give a higher
2 incentive to, somewhere around \$900 a kilowatt for T8
3 lighting as opposed to about 80 bucks a kilowatt for a
4 simple 34 replacement.

5 Q. That structure does two things,
6 doesn't it? It, one, attracts the benefit to the
7 utility better?

8 A. Sure.

9 Q. And two, the higher incentive, the
10 differential incentive acts to inspire people to opt --
11 more likely to opt for the more efficient measure?

12 A. I would have to look at it more
13 closely to see if it is actually a higher differential.

14 Q. All right.

15 A. It is in terms of the total benefit
16 that they end up getting in terms of matching the
17 energy savings and the better light rendition and the
18 whole kit 'n' kaboodle is what is critical.

19 And those sorts of sales approaches, if
20 you will, from either our field staff or our customers
21 wouldn't be allowed in a situation where we paid the
22 full incremental cost of lighting option A and lighting
23 option B if they were actually lighting options that
24 gave different benefits and had different costs.

25 Q. In other words, if you restrict your

1 program to the Osram model XYZ, Phillips, who makes a
2 different model, a different shape or a different
3 design, and Seimens and all the rest of them are upset.

...

1 [12:03 p.m.] A. No, that's not what I am saying, not
2 at all.

3 Q. I had thought that was your point
4 about--

5 A. Competition?

6 Q. --lighting manufacturers being upset
7 because you were, in effect, favouring one product?

8 A. No, that had to do with contractors
9 in terms of specing the retrofit job. We also got
10 similar advice from manufacturers.

11 What I talked about in terms of
12 differentiating 34-watt tubes which are the tubes we
13 have up here you, which you can just replace, you and I
14 could do to it, as opposed to doing a fixture
15 replacement where you went with T8 lamps, that when you
16 put the whole sales package together to show that to a
17 customer, to show option A, the 34-watt tubes or option
18 B, the T8 32-watt, electronic ballasts, better light
19 conditions, more energy savings, and you show them the
20 total package that, you know, there might be a little
21 bit more cost to the customer with the T8, but there is
22 more benefit.

23 And if we had a policy that just said,
24 okay, for whatever energy-efficient product there is,
25 Hydro is going to pay the increment, you wouldn't

1 be able to allow that kind of differentiation which got
2 you to quality lighting. I think one of the keystones
3 of our lighting program has been quality lighting
4 because when happened in the 70s was an awful lot of
5 delamping, turn it off, a lot of bad quality lighting
6 that resulted. And as soon as the so-called energy
7 crisis was over, all those dummy lamps came out, all
8 those places where people had delamped, went back in,
9 and the energy savings didn't last very long

10 Q. Let me ask you: Doesn't this speak
11 not to limiting incentives but speak to the need for
12 good program design? And let me expand. First of all,
13 with respect to the concern I took you to be making in
14 the first instance, competition between different
15 lighting suppliers, if you are prepared to offer the
16 incentive at the supplier level, at the wholesale
17 level, then they can convince you their bulb is as
18 efficient as the other guy's and they can qualify?

19 A. Yes, that's similar --

20 Q. So, that I take it is the simple
21 answer to that.

22 A. No, that's not really an issue. A T8
23 from Phillips is as efficient as a T8 from Osram and so
24 on.

25 Q. With respect to the other concern,

1 which is that you want to be able to give, in a sense,
2 a price signal to customers to go for the more
3 efficient one, and varying incentives is the way to do
4 that, first of all, the T8 being more efficient, even
5 if they are both getting 100 per cent, the number would
6 be higher for the T8 because it's more efficient, there
7 is more avoided cost; right?

8 A. Yes.

9 Q. And secondly, good program design
10 could -- if you were doing the installation or
11 intervening in the installation in some fashion, you
12 could make it a requisite that where it's, you know,
13 when we are talking standard commercial lighting, T8 is
14 what you are going to subsidize. You are not gong to
15 just subsidize a half measure.

16 A. That's exactly what we are trying to
17 do, say, with the federal government and try to get
18 some kind of across-the-board approach to it.

19 Q. So in other words, you could offer a
20 hundred per incentive but only for the better--

21 A. Right.

22 Q. --option for that end use?

23 A. Yes.

24 Q. And that wouldn't reduce the economic
25 potential; in fact, that would enhance it because you

1 wouldn't be competing with lesser efficiency options?

2 A. Yes, that would enhance the
3 attainable.

4 Q. Yes -- sorry, the attainable.

5 And then there is this concern expressed
6 here about unfair competition with the gas companies.
7 Has this led Hydro to support the Ontario Energy
8 Board's comments about the merits of Hydro achieving a
9 higher return on equity?

10 MR. WILSON: A. No, it hasn't.

11 Q. And you would agree that the fact
12 that Hydro doesn't have to achieve a comparable return
13 on equity to its private sector competitors puts Hydro
14 in an advantageous position; it's a market distortion
15 if you will?

16 MR. BURKE: A. I think we are talking
17 about different kinds of distortions here.

18 Q. Okay.

19 A. The gas utilities also have a
20 regulated rate of return on capital so it's not as if
21 one group is totally unregulated and other is totally
22 regulated.

23 But I think what is being referred to
24 here is perhaps the effect of an electric utility
25 diminishing the sales of a gas company through its

1 efficiency improvement policies, and that's the sort of
2 reason that we have felt inhibited about fuel switching
3 in the past and at least -- well, there is fuel
4 switching and then there is the question of whether you
5 apply efficiency improvements to a fuel switched
6 dwelling or not. All of these things that impact on
7 other people's business has not been defined so far
8 under the Power Corporation Act and so we have felt
9 inhibited about that sort of thing.

10 Q. Mr. Burke just on the point about
11 different types of subsidy. You have never hesitated
12 to promote electricity use in a competitive marketplace
13 even though you have this advantage of a lower return
14 on equity requirement than the private sector, even the
15 regulated private sector must routinely achieve.
16 That's never reined you in on that side where you are
17 going to have to provide supply to meet that. Has it?

18 MR. WILSON: A. No. I agree with that.

19 Q. All right. Now it seems to me what
20 we have is an \$80 conservation widget and \$100 supply
21 widget and you figure you might be able to get the
22 customer to go for the \$80 conservation widget if you
23 give him 50 bucks, you might not have to pay them the
24 80 bucks. You are hoping they will kick in the \$30
25 difference.

1 But isn't it true that, to the extent you
2 are wrong - because you only get so many shots at this
3 when the stock turn-over is happening and before you
4 have committed to the supply with the long lead time
5 and so on - if you miss out on that first opportunity,
6 it might be a lost opportunity and you are going to end
7 up having to to pay \$100 for the supply widget. Isn't
8 that the concern here?

9 A. Yes, it is.

10 Q. And indeed if we turn, in Volume 3,
11 Exhibit 21, back to the EPTAP comments, at page 17,
12 they actually say, and I quote, at the bottom of the
13 page:

14 Though barriers exist to the adoption
15 of conservation, Hydro could probably
16 implement most cost-effective
17 conservation measures for less than the
18 full marginal cost of new generation.
19 But in order to achieve high penetration
20 rates in each sector, it will probably be
21 necessary for Hydro to offer financial
22 assistance at levels up to the total cost
23 of each conservation measurement.

24 Ms. Fraser, do I take it from the
25 comments you have made that wherever you are learning

1 that's the case you are agreeing with EPTAP?

2 MS. FRASER: A. Yes.

3 MR. BURKE: A. I would just like to add
4 something, Mr. Poch. You will find that in the 1990
5 load forecasts, in Section 6.4 of that document, which
6 is Exhibit 9, that effectively in preparing the primary
7 load forecast for 1990, we assumed exactly the
8 principle that you have just read as being implicit in
9 the forecast we prepared for the year 2000.

10 It says:

11 By 1992/1993, expenditures by Ontario
12 Hydro to induce the take-up of efficient
13 technologies will generally be up to 100
14 per cent of incremental technology cost
15 and will be available up to full avoided
16 cost as required in order to achieve
17 maximum economic efficiency gain in each
18 segment.

19 And that was listed as one of the
20 assumptions we were making in being able to achieve the
21 2000 megawatts in the year 2000 as a forecast.

22 So, effectively, we have taken the
23 liberty of being forecasters as opposed to the people
24 who actually deliver and suggested that we would have
25 to relax this, even if, in fact, as Ms. Fraser is

1 indicating, we already are, in order to achieve the
2 results that we are planning on achieving.

3 Q. Mr. Burke, we are still at 2000 for
4 2000; right? We have agreed on that?

5 A. That's right. And that was what was
6 required in my view to achieve 2000 by 2000.

7 Q. And the 2000 in 2000 it's not an
8 arbitrary number, is it? It was one that you based on
9 an assumption about what kind of attainment rate you
10 could get and what the economic potential was; right?

11 A. It's based on estimates of induced
12 potential and it's based on estimates of penetration
13 rates. And to make it into a forecast, one has to
14 believe what it's going to take get those penetration
15 rates.

16 Q. And embedded in your assumption about
17 what's economic and in your assumption about attainment,
18 you had to make some preliminary estimates of: one,
19 things such as what the OM&A is going to cost, that
20 \$350 a kilowatt we spoke of earlier; and two, how much
21 attainment you were going to get, penetration, and to
22 some extent that's a function of the incentive level;
23 fair?

24 When you were striking the number 2000
25 for 2000 a few years ago, you made some assumptions.

1 And that's the basis for that number 2000 in 2000?

2 A. Every year we reconsider the 2000 in
3 2000 number as whether it should be the forecast or
4 not. And in the early years when the target was set,
5 the approach taken by the load forecast department and
6 the division as a whole was that it was too early to
7 judge whether or not programs would be successful in
8 delivering 2000 megawatts by the year 2000.

9 As we get closer and closer, depending on
10 the rate at which programs are entering the marketplace
11 and take-up and so on, we have to judge further whether
12 we think we can still get there. Each year we will be
13 reconsidering whether 2000 is a reasonable forecast to
14 make for the year 2000.

15 In fact, in the reference time of the
16 documents you have taken us through for the last day or
17 two were written, which was in the mid-80s, we had
18 expected to have a much -- in the planning that was
19 done in those days, a much more substantial program in
20 place by 1990 than in fact we did have.

21 So, we have had to consider whether it
22 was still possible to achieve 2000 in 2000. And in so
23 doing, we have felt in order to still make 2000 in
24 2000, we would have to relax this assumption, which is
25 why it was included in the 1990 load forecast document.

1 Q. Ms. Fraser, haven't you told us that
2 if you think, for whatever reason, times gone by, it is
3 getting tough to get to that target, haven't you, in
4 fact, in a number of cases raised the incentive level
5 to get a better increased likelihood or increased speed
6 of attainment to still do your best to meet that
7 target?

8 MS. FRASER: A. Yes. And all those
9 changes of incentives are in Interrogatoy 4.20.45,
10 which is in Exhibit 261.

11 Q. Let's remember that answer. We are
12 going to come back to this in a little while.

13 Now I would just like to touch on fuel
14 substitution briefly.

15 Mr. Chairman, as I indicated last week, I
16 don't anticipate -- I hope not to have to come back to
17 this, but there is some possibility that I will have to
18 come back to this after I hear from the analysts who
19 are looking at this. It may be that we can save that
20 for our case in reply.

21 But I do have some questions at this
22 point. First of all, is fuel switching, fuel
23 substitution, and indeed the assumptions about enhanced
24 standards, is it being put forward now as part of the
25 DSM plan or not?

1 MR. WILSON: A. Yes, it is.

2 This is subject to the legislature
3 passing the amendments to the Act.

4 Q. All right.

5 Mr. Wilson, when you introduced this in
6 chief, you spoke of these amendments which would lead
7 to encouragement of fuel substitution, where it was "in
8 the customer's and Hydro's interest", I think was the
9 phrase you used.

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...

1 [12:20 p.m.] A. Yes, that's right.

2 Q. Isn't the actual proposed wording of
3 the amendment somewhat broader, it speaks of Hydro
4 being able to assist where it would lead to the most
5 energy efficient alternative?

6 A. I don't have a copy of the Act before
7 me.

8 Q. Can you take it then, take that as a
9 given, if you will, that that's the proposed wording.
10 If that is indeed the test, are there not cases where
11 it may be in the customer's, the particular customer's
12 interest, and it may be in the interest of energy
13 efficiency, but a particular substitution might not
14 lower average Ontario Hydro bills?

15 A. I can see that possibility.

16 Q. All right. And have I interpreted
17 your evidence and targets correctly that where that's
18 the case, so where a customer can save money and it can
19 go to a more environmentally or what is deemed to be a
20 more environmentally benign alternative, you won't
21 promote it unless it also turns out to be cheaper than
22 your supply option?

23 A. Can I ask to repeat the question for
24 me? I am going to have to concentrate on this one.

25 Q. It's in the individual customer's

1 interest, they are going to save money, it fits into
2 this category where you have received the implied
3 blessing of government that this appears to be socially
4 or environmentally of value to switch to this
5 alternative fuel, is it fair that in that case you will
6 nevertheless not promote that switch unless it results
7 in a situation where it's cheaper for Hydro's system
8 than the supply alternative, the electricity supply
9 alternative?

10 A. We really haven't worked out the
11 specifics of how to operationalize the rules of the
12 game.

13 The approach that we have taken to this
14 point in estimating the cases that were described in my
15 direct last week and in the announcement of higher
16 targets, was that we attempted to construct a total
17 customer cost test which looked at the avoided costs on
18 the electricity supply system, the incurred costs on
19 the gas supplied system and the cost that consumers
20 would bear directly, or would be incurred in
21 accomplishing the fuel switch, and on that basis where
22 the total cost was higher than the benefit, then we
23 treated that as a beneficial change and we assumed that
24 we would proceeding with that fuel switching program.

25 Q. The point is that the yardstick is

1 the avoided cost of supply as you have defined it?

2 A. That's the benefit statement. The
3 costs of gas supply also come into the equation. It's
4 more complex for certain than electric efficiency
5 improvements.

6 Q. I agree with that, and you have
7 already agreed that there would be cases where you
8 might fail the total customer cost test as you have
9 done when you are comparing against system avoided
10 costs, but it would nevertheless have been in that
11 particular customer's interest to switch. I think you
12 agreed to that.

13 A. Oh, yes, that's true.

14 Q. And at this point you wouldn't
15 anticipate supporting such fuel substitution?

16 A. These are very early days. That's
17 our position at the moment.

18 Q. Right.

19 MR. BURKE: A. If I am following what
20 you are saying, Mr. Poch, the only circumstance that
21 would occur in is if there was a big different between
22 our avoided cost and our rates, is that why you think
23 there is an issue here?

24 Q. That's one way it could arise,
25 correct. And another way would be if there is a

1 differential in the cost of capital assumed.

2 A. Okay, but then we would no longer be
3 doing a social sort of test.

4 Certainly, we are deviating from a
5 private assessment of the interest of fuel switching.

6 Q. You are saying for social test you
7 need to use the same discount rate?

8 A. Yes.

9 Q. But I take it you would agree that if
10 there is a differential between your avoided cost and
11 your average cost, that would be a way that it could be
12 in the customer's interest but not necessarily in
13 Hydro's interests.

14 A. What I am suggesting to you, that's
15 the only thing I could think of at this point that
16 would raise that situation.

17 Q. You have indicated that this is now
18 part of your DSM plan. I take it, then, that
19 recommending the 1500 megawatt level which corresponds
20 to standards halfway between what was predicted in your
21 Plan 15 and what is economically justifiable and also
22 assumes that fuel switching will be mandated in new
23 residential and commercial, and that in existing you
24 will have programs to assist it, and you anticipate a
25 30 per cent penetration there; is that right?

1 MR. WILSON: A. I think you have just
2 described Case C, and that's one way in which we think
3 that extra 1500 megawatts can be accomplished.

4 I did point out the other day that there
5 probably are going to be different ways of meeting that
6 objective, and that's one way of doing it.

7 Q. All right. And the 30 per cent
8 level, I take it there is no marketing analysis behind
9 that number. You have simply adopted the number that
10 you anticipate for program, EEI program attainment
11 rate?

12 A. Yes, that's correct.

13 Q. Did I understand correctly from
14 yesterday, Mr. Burke, that that 30 per cent rate isn't
15 the ultimate number; that's just what you are going to
16 get in the first, I guess, it's eight years or
17 something, right?

18 MR. BURKE: A. It's the average
19 penetration rate over the decade. And in certain
20 programs the penetration rates ramp up with time and in
21 others they don't ramp up as much.

22 Q. In some they would carry on and get
23 higher as we go forward in time?

24 A. Well, with technologies that have
25 lives of roughly 10 years or so, you get into an

1 interesting situation where you get a second chance at
2 market take-up on these options, so that the cumulative
3 penetration rates start to get quite high. After 20 or
4 25 years you may have had two or three chances at the
5 same marketplace.

6 Q. And with technologies with longer
7 lifetimes, you will still be doing the first round, you
8 will still be getting higher penetration because you
9 will still be having opportunities arise as the home,
10 if it's in year 2 of a 20-year life for its furnace
11 right now, or whatever, comes up in the early 2000s; is
12 that right?

13 A. Yes, that's correct. Although I
14 think I pointed out that most of the opportunities that
15 have long lives are in building envelopes and we have
16 actually assumed that they are all, in terms of
17 potential, they are taken advantage of by the year
18 2000.

19 The opportunity to gain further market
20 penetration beyond the year 2000 certainly exists and
21 will add to the total effect.

22 Q. And particularly, in fuel
23 substitution where we are predominantly talking about
24 furnaces and water heaters, baseboard heaters, what
25 have you, these are relatively long-lived items?

1 A. Yes. But actually, I think for the
2 economic analysis that was done here, we have assumed
3 that we needn't wait to the end of the life for some of
4 this equipment.

5 Q. But, nevertheless, as there will be a
6 number of homes, for example, where the furnace is not
7 old enough yet in the year 1999 to justify the
8 substitution, but it might be in the year 2005; it may
9 not have to live out its whole life but it has to be
10 depreciated significantly?

11 A. My recollection is the way this
12 analysis is being done is that the entire potential for
13 fuel switching in these various segments that I
14 described in my direct evidence is available and
15 considered available by the year 2000, and so the
16 penetration rate of 30 per cent is applied to the
17 entire market.

18 Q. I see. So, the limit of 30 per cent
19 is not then a result of the fact that you don't have
20 access opportunities, if you will.

21 A. No. In this case the limit is, as
22 you said, we haven't done a great deal of market
23 research on this, so we have said, what penetration
24 rates do we typically get in residential programs of
25 this sort where we are trying to improve efficiency

1 levels, or in the commercial building programs, and we
2 have applied those penetration rates to fuel switching
3 as being indicative of the difficulty of getting
4 decisions by consumers to do something different. And
5 I suppose with more market study we will be able to
6 know whether that was a good assumption or not.

7 Q. I had thought I heard you yesterday
8 say that, in fact, the 30 per cent was only just the
9 result of picking 2000 as the year and that you will
10 achieve in some cases up to 75 per cent. Wouldn't you
11 carry that assumption over to this fuel switching at
12 least as a first premise?

13 A. The market penetration assumptions
14 that were used for fuel switching correspond to the
15 market penetration assumptions for similar programs in
16 the residential and commercial sectors, that is, for
17 building envelope sort of space heating-related
18 programs in the residential and commercial sectors.

19 Q. All right. You have indicated in the
20 text of, I think it is, Exhibit 257, that you would
21 anticipate - I think it is in the residential sector -
22 that the fuels substitution potential could double if
23 non-gas alternatives are considered.

24 First of all, have I got that right?

25 A. Well, it's nearly double. The only

1 area where the the potential doesn't grow is for those
2 water heaters that go into gas-heated houses. But
3 effectively in all areas, in all of the other elements,
4 it doubles.

5 Q. You have actually put a number, and
6 in your Exhibit 260 at page 41, you talked about 1600
7 megawatts if you look at non-gas alternatives, I take
8 it?

9 A. Yes. I believe that number is also
10 in Exhibit 257, I am just looking for it.

11 Q. All right. That is fine. Nothing
12 turns on that, where it is.

13 What would be the total attainable then?
14 I mean, I notice when I turn over the page to look at
15 the total attainable once you combine the fuel
16 switching and the standards and the EEI you are already
17 doing and you net out the overlaps we get to this
18 number. What is the total attainable if we count that
19 potential for non-gas fuel switching?

20 A. Well, I suppose the most
21 straightforward thing, we didn't estimate that, but...

22 Q. Can I suggest to you it would be
23 roughly 70 per cent of that 1600 more because you have
24 got to net out the 30 per cent attainment rate you are
25 assuming in your energy efficiency?

1 A. No, I think a better way to do it
2 would be to double the net impact due to space and
3 water heating because of the overlap with efficiency
4 improvement programs and so on. So, I don't think it's
5 a straight 70 per cent of the 1600. It's discounted
6 somewhat through the overlap with EEI and standards, so
7 I could find for you the number that you should double.

8 Q. If you would be so kind and you could
9 just come back and tell us about that later.

10 Should that be an undertaking, Mr.
11 Chairman? I don't know if Mr. Burke was suggesting he
12 could do it in a few minutes or....

13 A. Over lunch I could do it, but not
14 here answering your questions.

15 THE CHAIRMAN: Why wouldn't it be double
16 1500?

17 MR. BURKE: Double 1600 --

18 THE CHAIRMAN: 1500, which is what you
19 expect to achieve from the present annual switching
20 program?

21 MR. BURKE: No.

22 THE CHAIRMAN: Have I got the number
23 wrong?

24 MR. D. POCH: I think you have the number
25 right, Mr. Chairman, but that includes standards too,

1 if I am not mistaken.

2 MR. BURKE: If we look at Case C we are
3 expecting 1350 megawatts through fuel switching, some
4 of which is mandated and some of which is through
5 programs, and the fuel switching potential was 3120 net
6 of standards.

7 I don't think it's a straightforward
8 thing. If I could look at it over lunch. There is a
9 number in here which we can apply a factor of two to,
10 but I want to make sure it's one that has already taken
11 these various overlaps into account.

12 MR. D. POCH: Q. We will perhaps come
13 back to that after lunch. I am sure you will help me
14 remember.

15 Q. Now, I take it that oil and propane
16 aren't the only alternatives. Wood would be another
17 obvious one for the space heating.

18 MR. BURKE: A. We haven't really
19 analyzed which alternatives -- they would have to be
20 economic, that's the only issue.

21 Q. Wood is fairly prevalent in rural
22 Ontario, I take it. Do you have any numbers on it?

23 A. We have numbers on it. I don't have
24 them here as to the proportion of houses that do some
25 or all of their heating with wood. They are in the

1 residential plan survey results, I believe.

2 Q. All right. And just in terms of the
3 environmental impact of this, I take it there would be
4 no net carbon impact in a renewable wood program; is
5 that right, Mr. Wilson?

6 MR. WILSON: A. I couldn't even begin to
7 speculate on that question.

8 Q. Let's leave that then.

9 I take it you are seeking direction on
10 this question of how far to go on fuel switching. Was
11 that the substance of the letter you referred to from
12 your chairman to Mr. Davies who is the deputy minister?
13 Is that letter in the material somewhere?

14 A. I don't believe it is.

15 Q. Perhaps rather than asking you to
16 speak to your chairman, if Mr. Campbell has no
17 objection, if we could get that letter, give it a
18 number and we can look at it, that would be helpful.

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1 [12:37 p.m.] MR. B. CAMPBELL: That is fine, if we
2 could get the next exhibit number.

3 THE CHAIRMAN: The next exhibit number?

4 MR. NUNN: 275.

5 THE CHAIRMAN: 275.

6 MR. B. CAMPBELL: And it is a letter from
7 Mr. Eliesen to Mr. Davies, and my recollection would be
8 it is dated late June, but we will give it a proper
9 description once we have the exact date.

10 MS. FRASER: June 20.

11 MR. B. CAMPBELL: June 20?

12 MS. FRASER: Yes.

13 THE CHAIRMAN: Thank you. Thank you, Mr.
14 Chairman.

15 ---EXHIBIT NO. 275: Letter from Mr. Eliesen to
16 Mr. Davies, dated June 20.

17 MR. POCH: Q. All right. If I
18 paraphrased it, if I got the gist of it, it is
19 basically asking for government direction or how far to
20 go?

21 MR. WILSON: A. Yes, that's correct.

22 Q. Okay.

23 A. The approach we have taken with
24 energy forms other than natural gas that may be more
25 economic than electricity is the way it is stated.

1 Q. Okay.

2 MS. FRASER: A. I would point out it is
3 not just a question of how far we would go, it is also
4 how far they would go.

5 Q. Fair enough. When you were looking
6 at potential, when you were discussing this, I think
7 with Ms. Couban in chief and in the exhibit, you talk
8 about air-conditioning having little impact on system
9 peak except in those large commercial buildings where
10 they are pumping heat year round from the core to the
11 perimeter.

12 I take it then that, so far, you have
13 limited your fuel substitution analysis to alternatives
14 that impact on the winter peak?

15 MR. BURKE: A. Yes.

16 Q. All right. And have you looked at
17 the free cool proposal in the City of Toronto which
18 proposes to, I think, both heat and cool - at least,
19 cool initially - the vast railway lands development
20 with water from under the lake?

21 A. Well, I will just say something
22 briefly and then I am sure Ms. Fraser will add some
23 substantive detail, but just to say that in the
24 potential for EEI, we have included free cool this
25 year.

1 Q. Okay. And do you think it is
2 attainable, Ms. Fraser?

3 MS. FRASER: A. It is a major
4 undertaking and not to get the word confused with
5 undertakings here, it is certainly something that we
6 are very interested in looking at to see what the
7 ramifications are and the potential, the cost, the
8 benefits.

9 Q. All right. And, Mr. Shalaby, you are
10 an engineer; you can help us here, I am sure.

11 Given the laws of thermodynamics for
12 creating electricity at a generating --

13 MR. SHALABY: A. You really don't want
14 to get into thermodynamics, do you?

15 Q. All right. At a generation station
16 on Lake Ontario, I take it that free cool would heat up
17 the lake less than a central generating station would,
18 just in terms of the relative impacts at first cut.

19 A. I don't know that.

20 Q. Okay. We will leave that, too.

21 What about evaporative cooling, using gas
22 or using cogeneration heat output; is that excluded
23 because it doesn't a touch the winter peak basically?

24 MS. FRASER: A. Actually, we are looking
25 at some projects under savings by design, but the

1 approval of those is pending sort of strategic
2 direction.

3 We are looking at things like descicant
4 cooling which is basically as simple as spraying water
5 on the roof and it evaporates. So I think there is one
6 project on evaporative cooling that is approved.

7 Q. Okay. And desiccate cooling or
8 evaporative cooling are technologies that use heat from
9 gas or another form or the heat from a cogenerator to
10 cool?

11 A. Well, evaporative is even much
12 simpler. You just spray water on the roof.

13 Q. Yes. And --

14 A. Solar, I guess.

15 Q. You have been looking at these in the
16 context of these buildings that cool year round?

17 A. Yes. It is major industrial plants
18 where there is a fairly heavy heating load that even in
19 the winter requires cooling to make it good for the
20 employees.

21 Q. So, this is an example that isn't
22 merely excluded from the fuel substitution discussion
23 because it doesn't touch winter peak; it is an energy
24 efficiency measure which you haven't looked at the
25 potential to save energy in -- of the vast number of

1 homes and commercial spaces where they don't cool in
2 the middle of the winter; they just cool in the summer?

3 A. Actually, the window film part of the
4 savings by design, some of those applications are
5 justified solely on the energy savings arising from
6 summer cooling, so we have included those and allowed
7 them.

8 However, when we start to tally up the
9 results and look at it, the basic load forecast to the
10 primary load forecast, if they don't apply to the
11 winter they don't get counted in those numbers
12 obviously because they don't take anything from the
13 winter, but we are looking at them and we do provide
14 incentives for window film.

15 Q. All right. So they don't have a
16 megawatt impact; they have a megawatthour impact
17 though?

18 A. Yes.

19 Q. All right.

20 A. Yes.

21 Q. Maybe I misunderstood you, Mr. Burke.
22 I had thought you didn't bother pursuing air
23 conditioners, air conditioner efficiency improvements,
24 to the extent in those sectors where they didn't touch
25 on peak.

1 A. That is correct. We have focused on
2 the extent to which efficiency improvement would reduce
3 winter peak for demand/supply planning purposes and we
4 have not really addressed the economic energy savings
5 in the summer if such exist.

6 Q. All right. Mr. Shalaby, weren't we
7 told in Panel 3 that you anticipated that the avoided
8 cost numbers were going to change to reflect a value
9 for capacity in the summer, and I think that was in
10 part because you have got so many plants down for
11 maintenance in the summer?

12 MR. SHALABY: A. I think we said we are
13 considering the value of capacity in the summer.

14 Q. All right. And I had heard ad
15 nauseum, if I may, in Panel 3 that this whole plan
16 wasn't being driven so much by capacity; recall the
17 discussion we had about whether it is a \$50,000
18 electrically-heated home or in terms of its costs to
19 the system or if it is -- I think you offered a number
20 of 15,000, whatever the number, and we went again and
21 again into how you don't build nuclear plants for
22 capacity. They have this energy credit. And that the
23 capacity cost is just the cost of building a combustion
24 turbine, not even running it.

25 Have I completely misunderstood the Panel

1 3 evidence? I had thought it was quite clear you were
2 justifying nuclear because it provides energy year
3 round?

4 A. No, you haven't misunderstood.

5 Q. All right.

6 A. The plan that we are putting together
7 is to provide both capacity and energy. Energy is a
8 component in the plan.

9 Q. And just to refresh our memories, the
10 energy component of avoided cost far outweighs the
11 capacity component value?

12 A. Typically. In most applications it
13 does, yes.

14 Q. I don't know if I have impliedly
15 asked you for this in asking you to provide the number,
16 Mr. Burke. You said you would with respect to non-gas
17 alternatives.

18 Is there any analysis or will there be
19 any analysis of the total potential economic and
20 energy-efficient fuel switching opportunity out there
21 capturing all uses and all fuels and so on? Is that
22 something that is being worked up?

23 MR. BURKE: A. Well, I am sure it will
24 be. The exhibit you have before you is the result of
25 work that was undertaken, we make no bones about it, in

1 July of this year in order to be in a position to make
2 some sensible statements about what the fuel switching
3 possibilities were, certainly the principal ones. And
4 if it should turn out that the summer savings are
5 economic, I am sure we will be studying them.

6 I would point out though that were we to
7 switch our avoided costs to taking more consideration
8 of summer peak, it might actually have the effect of
9 reducing the economics of winter peak options and it is
10 not clear where all this will end up.

11 So, in the fullness of time, we would
12 like to look at all of the options that could
13 conceivably emerge, but we have so far focused on the
14 ones that we thought were the principal ones and which
15 would affect the winter peak requirements.

16 Q. All right. Let me paraphrase then.
17 You have used the word "focus", so in a sense it is a
18 kind of informal screening. You have understood that
19 there is greater value in options which save energy and
20 capacity, and capacity these days is winter peak.

21 A. It is my understanding that given the
22 avoided costs as they are now, I would not expect to
23 find air-conditioning loads to be cost effective to
24 fuel switch at this point.

25 I haven't done the analysis, but on the

1 basis of experience elsewhere, it seems to be that you
2 need to be a summer peaking utility in order to justify
3 that, but --

4 Q. So you said you haven't done the
5 analysis, so I take it you haven't actually looked at
6 what the avoided cost tables tell us the relative value
7 of capacity and energy are in that analysis. This is
8 just an assumption that you have made from the
9 experience of other utilities; is that right?

10 A. And also from our own looking at
11 chillers in these non-office situations; that is, in
12 situations other than the ones where there is an
13 air-conditioning load in the middle of the winter.

14 Q. Mr. Burke, wouldn't you agree when
15 you look at other utilities, a lot of other utilities
16 have a much greater concern about capacity because of
17 the particular supply options they are looking at and
18 the way they value them?

19 A. I don't think there is any merit in
20 pursuing whether my judgment is correctly based on
21 other utility performance,

22 Q. All right.

23 A. I think my sense certainly was that
24 in our analysis, we would not get a positive result.
25 And I may be proven wrong on that, but the expectation

1 was that we would not find switching air-conditioning
2 loads in the summer to be cost effective.

3 Q. You are telling me based on what you
4 know. Do you know what the relative capacity versus
5 energy values are off-hand?

6 A. I haven't got the avoided cost
7 tables. I have rough ideas. I also know that the
8 energy values in summer are lower than the values in
9 the winter so that it doesn't just follow that you can
10 look at the capacity and energy values in winter and
11 say, well, if there is a lot in the energy charge, that
12 the analysis in the summer would just drop out.

13 Q. Excuse me.

14 Mr. Burke - no, I think it was Mr.
15 Shalaby - in discussing this potential in the
16 transcript at Volume 47, at page 8541, you said --
17 oh, yes, and it is Mr. Burke answering. It is just on
18 the previous page he refers to Mr. Shalaby having
19 alluded to. So, Mr. Burke, I think this was your
20 comment, and I will quote, the top of the page 8541:

21 "I should say that there is
22 considerable risk associated with
23 forecasting long-run natural gas prices,
24 or oil prices for that matter, and we are
25 looking to the government for some

1 guidance on the future avoided cost of
2 gas or oil that should be used when
3 making this sort of strategic decision.

4 I think it is also important for
5 everybody to understand what the
6 implications would be if this forecast
7 proved to be incorrect, and we had a lot
8 of customers on gas that would later like
9 to switch to something else. The
10 implications would not just be for the
11 customers, but they'd also be for the
12 electric utility and the province as a
13 whole."

14 First of all, I take it from the customer
15 perspective right now that the price differential
16 between gas and electricity is robust. Your own
17 analysis has shown us that.

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25 ...

1 [12:50 p.m.] A. Certainly there is quite an advantage
2 for the customer if he has the opportunity.

3 Q. And don't you have to estimate future
4 fuel prices, especially electricity prices, energy form
5 prices, to evaluate electric supply options too?

6 A. Yes, we do.

7 Q. And isn't there a risk of
8 electric-heating customers wanting to switch too? If
9 you are wrong, if you have gone and spent money on
10 supply based on what turns out to be a wrong forecast
11 of what the price of electricity is going to be, your
12 supply cost forecast was wrong, that's the other half
13 of this risk?

14 A. Yes. I guess the question is whether
15 they are symmetrical or not.

16 Q. And is it your evidence that supply
17 costs, for example, for nuclear power haven't been
18 volatile?

19 A. Well, as a matter of fact they
20 haven't really been. The expected costs, the real
21 costs of power from each of these supply options are
22 very comparable to our current real rate.

23 Q. So, Mr. Burke, are you saying then
24 that in the 80s when you were promoting electric
25 heating, you knew then that it wasn't going to be cost

1 effective for customers; it's not an artifact of now
2 learning that the supply costs, electric costs have
3 been higher?

4 A. I think in the early 1980s the price
5 of gas was considerably higher than it is today,
6 roughly double, maybe triple, 2-1/2 times anyway. And
7 I am not going to -- you say promote electricity. I
8 can't remember exactly that we promoted it in the
9 1980s. But we certainly didn't offer incentives to
10 people to use it.

11 The price of gas has changed and that's
12 actually part of the issue here. It is quite a
13 volatile price. It is much more volatile than the
14 price of electricity.

15 Q. Were you forecasting double-digit
16 electricity price increases a decade ago?

17 A. It depends who you are talking to.

18 Q. Was Hydro's official forecast for
19 double digit?

20 A. Hydro's official forecast was not for
21 double digit, no.

22 Q. And you have told us you are
23 experiencing and anticipating double digit and that
24 reflects costs, does it not, your cost-based rates?

25 A. This is a short-term period of

1 nominal double-digit rates. In real terms, these rates
2 are 6, 7 per cent real for several years. But yes,
3 these are higher real rates.

4 However, even what sounds sort of
5 extreme, in the electricity context, that we might have
6 20 per cent, 30 per cent real rate increases over a
7 long period of time is a very small change compared to
8 the oscillations that have occurred in natural gas and
9 could conceivably occur in natural gas prices in
10 future.

11 We have, after all, seen gas prices at
12 two to three times their current level if you go back
13 to the late 70s and early 80s in real terms.

14 Maybe I should say, at world prices
15 certainly. In Canada and in Ontario we didn't
16 necessarily face those prices. But now that we have
17 deregulated natural gas prices, the expectation is that
18 we would face world prices in future.

19 Q. All right. Mr. Burke, could you turn
20 up Exhibit 74, page 39. We have just finished
21 discussing -- this is page 39, Mr. Burke. We were just
22 discussing the restrictions you have placed explicitly
23 or implicitly through your search on fuel substitution
24 away from electricity.

25 And this is a discussion I am referring

1 you now under the heading "Electrotechnology Transfer",
2 which to some extent we have discussed, involves some
3 fuel substitution in favour of electricity and I would
4 like to read you. First of all it says:

5 "Ontario Hydro has always been active
6 in looking for new and better electric
7 technologies that can benefit our
8 customers and improve the Ontario economy
9 or environment. Ontario Hydro has also
10 been active in transferring mature and
11 new electric technologies to Ontario
12 industries, so that they can market
13 products using the new technology."

14 It gives some examples. It goes on:

15 "If the electrotechnology improves the
16 efficiency of an existing electricity
17 use, it will reduce demand. If it
18 substitutes for a less effective use of
19 another energy form, it may increase
20 electricity demand, but reduce total
21 energy demand."

22 Mr. Burke, I was pursuing that with you,
23 not under that title, but pursuing that with you in
24 Panel 1 you will recall, and we looked at a lot of
25 advertisements and so on. They were in Exhibits 108

1 and 109 is my recollection.

2 We asked you if you could quantify the
3 impacts of Hydro's marketing and Hydro's technology
4 promotion and all these various activities and you said
5 you couldn't. Do you recall that?

6 A. Yes, I do.

7 Q. In Interrogatory 4.7.1 we asked you
8 for a quantification as well. In fact, that one
9 predated Panel 1. Could you turn up our Volume 2 of
10 materials, page 76. You go through a list of various
11 programs on the following pages. This is for '84
12 through '88 inclusive; correct, Mr. Burke?

13 A. Yes.

14 Q. And if you turn to page 80 of our
15 exhibit under "Results", for all those years, you tell
16 us, no estimates, no results available. They hadn't
17 been either monitored or they were not available for
18 other reasons; correct?

19 A. That's what it says and that's what I
20 understand is the case.

21 Q. Could you turn to page 52 of this
22 volume.

23 Mr. Burke this is an exhibit, Exhibit No.
24 31.15 filed before the Ontario Energy Board in the
25 HR 18 hearing on 1990 rates in April of '89.

1 First of all, before I even comment on
2 that, the answer we looked at a moment ago 4.71, I see
3 it was received by you in 90/10/23 and answered in
4 91/06/14. I take it from that it took you 8 months to
5 answer that interrogatory. Can I assume that's because
6 both the work load and because you gave us a considered
7 response?

8 A. It wasn't me personally. I will find
9 out.

10 Q. All right. Nothing turns on that.

11 But if we could go to the OEB exhibit.
12 This gives us some results for 1988, does it not? Page
13 54. You will see a number of programs listed and there
14 are different headings. And it says they are add,
15 shift and save. And I take it that means add load,
16 shift load, or save load?

17 MS. FRASER: A. Yes, it does.

18 Q. And the bottom line is for '88,
19 energy management impacts, you are adding more than you
20 are saving? Isn't that right?

21 A. That's what these numbers show, yes.
22 I believe. I haven't added them all up together
23 lately.

24 Q. Now, I --

25 A. No, I think by the time you put the

1 shifting in there it's pretty well on a balance.

2 Q. So, first of all, you were able to
3 quantify some of these results for the OEB, I take
4 it --

5 MR. BURKE: A. One subtlety that I have
6 always maintained, Mr. Poch, is that there is a
7 difference between the gross impact and the net impact
8 on load forecasts. And the thing that we have never
9 really been able to nail down quite so well about the
10 load adding megawatts is how much they really change
11 what people would otherwise have done.

12 There was very little effort made to
13 actually separate that out from what it says
14 influencing; that is, you talk to a customer, the
15 customer did something, we have recorded what the
16 customer has done. Was it something that they would
17 have done otherwise or wouldn't they? That sort of
18 part of it was not available. The numbers you are
19 looking at are what I would call gross megawatt
20 impacts.

21 Q. Yes. And Ms. Fraser, your point is
22 there is also a shifting in here but that has nothing
23 to do with energy efficiency, does it? That just has
24 to do with peak?

25 MS. FRASER: A. Sometimes load shifting

1 can result in energy efficiency.

2 Q. Generally speaking it's not about
3 saving energy; right?.

4 A. Thermal cool storage does both.

5 Q. But if we were focusing on energy
6 efficiency versus adding of load in each sector here in
7 '88, you are adding more than you are saving?

8 A. That's correct.

9 Q. And Mr. Burke, you are telling us you
10 didn't think it was appropriate or you are presuming it
11 wasn't appropriate to provide this evidence to this
12 Board, this evidence somebody swore to at Ontario
13 Hydro, before the OEB because you don't have confidence
14 that it demonstrate the net impacts?

15 MR. BURKE: A. I think as it says in the
16 interrogatory response that you stated, we looked at
17 before, we don't have the net impact on load of these
18 results. And it was my claim in Panel 1 and it's still
19 my claim that we still don't know what the net impact
20 on the load forecast of these influenced megawatts that
21 the energy management branch is quoting the results of
22 here. And certainly no change was made to the load
23 forecast because of them. And in discussions with
24 energy management branch, we were not able to determine
25 a net impact estimate.

1 Q. Mr. Burke, you don't in your
2 econometric forecast make changes because of little
3 programs at the end-use level, do you? You just see
4 what trend results? And it may result from this or it
5 may not, but if it does result it has impacted your
6 econometric forecast at least?

7 A. Yes, but I don't know whether it has
8 or not.

9 Q. Right.

10 A. You seem to know that it has but I
11 don't know and that's the situation.

12 Q. I am not suggesting that, Mr. Burke.
13 Mr. Chairman that is a good point --

14 DR. CONNELL: May I ask what the units
15 are here?

16 MS. FRASER: Megawatts.

17 DR. CONNELL: Thank you.

18 MR. D. POCH: Mr. Chairman, this would be
19 a good point to break.

20 THE CHAIRMAN: We will break until
21 two-thirty.

22 ---Luncheon recess at 1:04 p.m.

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...

1 ---On resuming at 2:30 p.m.

2 THE CHAIRMAN: Please be seated.

3 Just for the purpose of the record, Ms.

4 Mitchell is not at the moment a member of the panel and
5 will not be here again this afternoon but is expected
6 back tomorrow morning.

7 ---Ms. Mitchell withdraws from panel for duration of
8 afternoon only.

9 MR. B. CAMPBELL: That's correct, Mr.
10 Chairman.

11 I have copies of what is Exhibit 275,
12 although for reasons that are not clear to me, the
13 holes seemed to be punched on the right-hand side as
14 opposed to the left-hand side. But I do have copies
15 here, so I could provide eight copies to Mr. Nunn, and
16 I believe I have copies sufficient for everyone else,
17 and that's Exhibit 275.

18 I believe Mr. Burke had undertaken to
19 obtain some numbers over lunch and I believe he has
20 those for Mr. Poch at the moment.

21 MR. BURKE: I am in a position to give
22 you the numbers that you asked for concerning what
23 would happen to attainable if we added oil to the list.
24 My presumption from our discussion before lunch is that
25 you are not interested in cases of mandation, you are

1 interested in just what would happen from the
2 perspective of Hydro's programs. That's really
3 analagous to what was included in Case A of the
4 scenarios in 258.

5 MR. D. POCH: Q. Well, if it's simple we
6 have could have it either way. I assume it's just a
7 scale up by a factor of three, the difference

8 MR. BURKE: A. Nothing is simple in
9 this, but I will give you what I can for Case A.

10 If you look on page 12 of Exhibit 258,
11 Table 7, the residential sector, fuel switching
12 potential by the year 2000. And by the way, it's only
13 the residential sector that is impacted because in the
14 commercial sector, as you may recall, we said that that
15 was assumed to be, in gas available areas, 100 per
16 cent.

17 So, in the residential sector the only
18 thing that doesn't --

19 THE CHAIRMAN: Could you just wait a
20 moment until we dig out 258.

21 MR. D. POCH: Q. 257 or 258, Mr. Burke?

22 MR. BURKE: A. Starting with 257, page
23 12, looking at the potential. The only element there
24 which is not effectively doubled is the entry for
25 existing electric water heating in gas space-heated

1 houses, the 141 megawatts. So, the potential for a
2 movement to oil is 1,765 megawatts in that table, minus
3 141.

4 THE CHAIRMAN: Don't go quite so fast.
5 If you can just explain what the figures are as you
6 give them out.

7 MR. BURKE: The total residential sector
8 fuel switching potential by the year 2000 in Table 7 is
9 1,765 megawatts. The 141 megawatts in gas-heated
10 houses is not part of the increment that would occur if
11 we permitted switching in non-gas areas. So, the
12 additional potential is 1,624 megawatts, which is
13 derived by subtracting 141 from 1,765.

14 Then to get the attainable, the
15 penetration rate used in --

16 MR. B. CAMPBELL: Just a minute, Mr.
17 Burke. Do I understand it correctly then that to get
18 the total potential if oil is included, you add the
19 1,765 and the 1,624?

20 MR. BURKE: That's correct.

21 MR. B. CAMPBELL: Okay.

22 MR. BURKE: What I am providing is the
23 amount to be added to our estimates because we are
24 including oil or other fuels in areas where gas was not
25 available.

1 MR. B. CAMPBELL: Okay.

2 MR. BURKE: And then in Exhibit 258, the
3 penetration rate used for residential fuel switching
4 programs was 23 per cent. I think that is most readily
5 seen if you look at Appendix C1, which is pure program
6 driven EEI and fuel switching. And applying that
7 penetration rate, the additional fuel switching
8 potential is 373 megawatts, that's in addition to the
9 410 for the residential sector that was there already.

10 To get a correct total impact, the
11 overlap with the electrical efficiency improvements has
12 to be netted out, and that works out, the overlap works
13 out to about 150 megawatts. So, that is the reduction
14 in EEI in Case A would be 150 megawatts, and the total
15 net addition to Case A would be 223 megawatts.

16 Because the mandation occurs in segments
17 of the market, to apply this to the other cases one
18 just has to carefully work through and change the
19 penetration rates only in the applicable segments.

20 MR. D. POCH: Q. First of all, the 23
21 per cent penetration rate, I was wrong before when I
22 suggested to you then that for the program-driven fuel
23 switching, 30 per cent is the number. You have used 23
24 in the residential and that's where the bulk of this
25 fuel switching would occur; right?

1 MR. BURKE: A. No, no. As a matter of
2 fact, 23 per cent is the penetration rate in
3 residential, 34 or 35 per cent is the penetration rate
4 in commercial. And if you look Appendix C1, for
5 instance, or the --

6 Q. You don't have to prove it to me. I
7 just want a clarification, 30 per cent is the average
8 across all sectors?

9 A. Yes, across the sector.

10 Q. That would be a weighted average?

11 A. Yes. And the residential fuel
12 switching potential is higher than the commercial fuel
13 switching potential.

14 Q. All right. So, 23 per cent, then,
15 just as an aside, that's the typical penetration you
16 are going to be getting in the residential sector on
17 energy efficiency improvements programs as well, not
18 just fuel switching?

19 A. Yes, that's the basis of that number.

20 THE CHAIRMAN: I must be behind again. I
21 thought I heard you say that the residential potential
22 was greater than the commercial potential; is that what
23 you said?

24 MR. BURKE: That's correct, yes.

25 THE CHAIRMAN: I am looking at C1 and I

1 see the residential at 1,790 potential and the
2 commercial at 2,670 potential.

3 MR. BURKE: That's for EEI. I was
4 talking fuel switching.

5 THE CHAIRMAN: I'm sorry.

6 MR. BURKE: The third column. The
7 residential potential is somewhat larger than the
8 commercial at 1,770 for residential, 1,360 for
9 commercial.

10 However, if you look at the very
11 right-hand side, where we have calculated the
12 attainable total, you note that the commercial
13 attainable total is slightly larger than the
14 residential, and that results from the fact that the
15 penetration rate is higher even though it's on a
16 smaller base.

17 MR. D. POCH: Q. Mr. Burke, would it be
18 possible for you to estimate for us now the impact on
19 Case C, Case C being the scenario where it's mandated
20 in new applications, although you don't do any
21 mandatory with respect to existing uses.

22 MR. BURKE: A. I wouldn't like to do it
23 right here. Just as in the other, I want to make sure
24 you choose the right numbers.

25 Q. Okay. Since you have indicated that

1 your working assumption is 1500 megawatts, and Case C
2 is the closest to that, could I ask you then to do that
3 number crunching exercise when you have a moment, it
4 need not be this afternoon, and provide us with a
5 comparable rundown for Case C?

6 A. Yes, I can do that.

7 Q. Thank you. And just with respect to
8 the scenario that you just gave us --

9 THE CHAIRMAN: Just a moment, do you want
10 to put a number on that?

11 MR. D. POCH: Perhaps that would be
12 helpful so we don't lose track, Mr. Chairman.

13 MR. NUNN: That will be 267.5.

14 ---UNDERTAKING NO. 267.5: Ontario Hydro undertakes to
15 provide Case C figures for fuel switching
to oil.

16 MR. D. POCH: Q. Mr. Burke, are you with
17 us now? With respect to the numbers you did just
18 provide us with, I am struck by the large overlap
19 number there, you came up with 373 megawatts of
20 attainable fuel switching before you discount for the
21 overlap with efficiency programs.

22 If we are talking the same penetration
23 rate for EEI programs, 23 per cent, I would have
24 thought then that the overlap would have only been 23
25 per cent; that is, of the 373 that you assume will fuel

1 switch, assuming that they are a random sampling of
2 that sector, we would have anticipated 23 per cent
3 attainment on the EEI side and we should therefore
4 deduct 23 per cent of 373.

5 MR. BURKE: A. The way I look at it, on
6 page 6 at the top, that's page 6 of Exhibit 258, the
7 top of the page, there is Table 4, the top row gives of
8 the residential fuel switching potential, and then on
9 the third column it gives the offsetting effects of
10 fuel switching on EEI potential, which is 710
11 megawatts. Essentially, what it says is that roughly
12 40 per cent, which is the number I gave for the amount
13 of efficiency improvement in residential thermal
14 envelopes, that we were using in this analysis, roughly
15 40 per cent of that energy would have been saved in
16 those houses through EEI. That is how you get 710,
17 effectively, relative to the 1,770. That is, we would
18 have saved 40 per cent of that energy but we are
19 actually only gaining the 60 per cent due to fuel
20 switching. If I apply 23 per cent to that, discounting
21 slightly for the fact that it is not 1,770 for fuel
22 switching but in fact only 1,624, as I just indicated,
23 when we are looking at the oil market, I am looking at
24 650 megawatts or so of overlap with EEI program
25 potential, and I take 23 per cent of that and I get

1 150.

2 Q. All right.

3 A. I think it is just a statement of how
4 much we were planning to improve the efficiency of
5 those houses before we fuel switch that results in that
6 high number.

7 Q. While we are jiggling numbers on
8 these exhibits, I have a few other similar questions.

9 First of all, the numbers you have given
10 us are for the year 2000. Do you have numbers for the
11 year 2014?

12 A. I can give you numbers for 2014 or
13 2015 that are based on some very simple extrapolations
14 from the year 2000 result. We did not repeat the
15 entire analysis for the year 2015. In fact, what we
16 did was to apply the same profile to the load
17 reductions that we had originally obtained for the EEI
18 load reductions.

19 The reason it's complicated is the matter
20 we alluded to this morning, that you revisit the same
21 stock several times in the EEI case, and strictly
22 speaking, you could revisit some of these decisions for
23 fuel switching several times over the period to 2015.

24 So, that what we did, effectively, was to
25 apply that same profile. I can give you those numbers.

1 Clearly people internally have been
2 interested themselves in the long-term effects and in
3 the time available this was the best we could give
4 them, if that's of help to you. With all those
5 conditions --

6 Q. I take it then, and we will come to
7 this later, this is then a projection based on the same
8 kind of attainment curve that you have assumed for EEI,
9 and we have seen that and we will see it again as one
10 that rises steeply to 2000 and then tends to level off.

11 A. As I mentioned in my direct, the
12 reason for that is the extent to which the potential in
13 existing stock has been utilized.

14 Q. And just so I understand, we are
15 talking here heating and water heating. What is the
16 average life of the appliances that we are assuming?

17 A. Well, in the case of electric space
18 heating equipment I think we are using 25 years, and in
19 the case of water heating, 15 years.

20 Q. And your potential numbers for the
21 year 2000 represent what percentage of that gross
22 potential for the entire stock in light of the turnover
23 rate assumptions and the intervention rate assumptions
24 you have made?

25

...

1 [2:49 p.m.] A. Sorry, I didn't quite catch --

2 Q. Well, I assume you have limited the
3 number -- in the year 2000 analysis--

4 A. Yes.

5 Q. --the potential number that you have
6 given us that you start from is one that is capped by
7 virtue of the fact that a number - half of these water
8 heaters and somewhere between half and two thirds of
9 the furnaces won't yet have come up for a turnover and
10 so they are not yet part of the potential.

11 A. No. As a matter of fact, for the
12 purpose of this analysis, we simplified things and said
13 all of the water heaters, all of the houses would be
14 eligible by the year 2000 and the penetration rate
15 applies to that.

16 But effectively what we are implying in
17 the way we have extended this beyond the year 2000 is
18 to suggest that we get a second kick at the houses we
19 didn't get between 2000 and 2015.

20 Q. And that is in terms of the
21 program-driven side then?

22 A. Yes.

23 Q. Okay.

24 A. Did you want the number?

25 Q. Sure, that would be helpful. I take

1 it they aren't vastly different then with those
2 assumptions, but go ahead, give them to us.

3 A. Well, --

4 MR. B. CAMPBELL: If I have understood
5 what Mr. Burke has said, in effect this would amount to
6 a whole other set of tables C1 through C5 and Exhibit
7 258.

8 MR. BURKE: No. All we really have at
9 this point is the total for each of --

10 MR. B. CAMPBELL: Oh, all right, well,
11 let's do it.

12 MR. D. POCH: Q. Let's have what you
13 have.

14 MR. BURKE: A. Okay. You are interested
15 in Case C?

16 Q. You can give them all to us. I take
17 it it is only one number for each of five cases, right?

18 A. Okay. Well, as a matter of fact, for
19 the peculiar reasons, I don't have Case D just because
20 no one was really interested in Case D, but anyway I
21 have Case A, B, C and E.

22 Case A, do you want 2015 or 2014?

23 Q. Why don't you give us both if you
24 have got them. I think you can probably read them
25 faster than you can ask me the --

1 MR. B. CAMPBELL: I am going to frame
2 this bit of transcript. I have said to my witnesses
3 about 100,000 times over the years, it is not a wise
4 thing to offer a choice because the cross-examiner will
5 simply say both. This is great. I can use this exact
6 answer, thank you, Mr. Burke. (laughter)

7 MR. BURKE: Well, the significance of the
8 difference between these numbers is for you to
9 interpret.

10 Anyway, I will give you the 2014s first.
11 Case A is 4,931; Case b is 6,128; Case C is 6,653; Case
12 E is 8,731.

13 And then for 2015: Case A, 5,055; Case
14 B, 6,282; Case C, 6,820; and Case E, 8,950.

15 Now, no great accuracy is implied by all
16 of these digits. It is just the extrapolation as I
17 indicated.

18 One of reasons we did this was we wanted
19 to be able to compare with the Ministry of Energy's
20 estimates for the year 2005, so we were doing this in a
21 very simple-minded way.

22 MR. D. POCH: Q. Just in terms of the
23 tables, we would plug these in under the total EEI and
24 FS column, bottom line, all sectors?

25 MR. BURKE: A. That's correct.

1 Q. All right. I have a number of
2 questions here which I have been provided with, but I
3 don't have all of the source documents that have given
4 rise to these questions. So, a number of these you may
5 simply want to check on and get back to me on and that
6 is certainly fine.

7 In the residential analysis, and this is
8 Exhibit 257, I think you used the number 500,000 - yes,
9 you do at page 3 - 500,000 electrically-heated houses
10 in the province in 1990.

11 I am informed that the 1990 end-use
12 forecast tells us there are 484,000 electrically-heated
13 houses not including heat pumps and 580,000 when they
14 are included; that is rounded.

15 A. I addressed this issue in my direct
16 and I indicated at the time that there are 480,000
17 roughly all electrically-heated houses; that there are
18 another 100,000 heat pumps; that some of those heat
19 pumps were not electrically backed; and probably if you
20 took our best estimate of the number of
21 electrically-heated all-electric heat pumps in the
22 province out of that 100,000, you would end up with a
23 number around 510 or 520,000 all electrically-heated
24 houses, but as I indicated in my direct, for the
25 purpose of that study, we rounded to 500,000.

1 Q. Okay, thank you. I do recall that.

2 I apologize.

3 Now, is this study based on the 1990 load
4 forecast or the 1989 load forecast? I am informed it
5 is the '89; is that right?

6 A. As I indicated several times in my
7 direct, for the residential sector -- the assumptions
8 are the same as for Exhibit 76.

9 What may not be clear is that Exhibit 76,
10 as I indicated in my direct and I also mentioned this
11 for Exhibit 258, the residential sector is based on the
12 1990 load forecast and the commercial and industrial
13 sectors are based on the 1989 load forecast. And I
14 explained that simply it was a matter of timing. We
15 were not able to incorporate the 1990 results into
16 Exhibit 76 for those two sectors in time.

17 Q. Okay.

18 A. And I further - just to repeat
19 essentially what I said in my direct - I further
20 indicated it would be my expectation that the numbers
21 would go down if we use the 1990 load forecast rather
22 than the 1989 load forecast.

23 Q. The 1990 commercial and industrial?

24 A. Yes.

25 Q. Oh.

1 THE CHAIRMAN: Sorry, I don't follow that
2 dialogue.

3 Aren't we talking about residential?

4 MR. BURKE: Well, Mr. Poch was, I think,
5 switching ground to the source for the whole document
6 in terms of which load forecast backed up the estimates
7 in Exhibit 257.

8 THE CHAIRMAN: But we are talking here
9 about electrically-heated homes, I thought.

10 MR. D. POCH: Yes.

11 Q. And I take it you did use the 1990
12 then; is that what you just said?

13 MR. BURKE: A. For the residential
14 sector, yes.

15 Q. So, there wouldn't be any fall there
16 in electrically-heated homes?

17 A. No.

18 Q. You have already gotten that?

19 A. Yes. The residential sector will not
20 change.

21 Q. All right. Thank you.

22 I also understood you to say about a
23 third of homes are central systems?

24 A. That is our information, yes.

25 Q. All right. And can you confirm for

1 me, the numbers my consultants provide me with are .39
2 actually if you use 1990 numbers?

3 A. Sorry, .39 is what?

4 Q. It would be 39 per cent; is that ...

5 A. Well, I don't have anything other
6 than the one third value that I worked with.

7 Q. I assumed that was one you would
8 simply have to get back to me and check if you would be
9 so kind.

10 A. Well, what I am saying --

11 THE CHAIRMAN: I just ask the question
12 perhaps naively: Is the difference between 39 and .33
13 significant in the context of this particular
14 examination?

15 MR. D. POCH: Well, it works out to
16 28,000 homes.

17 THE CHAIRMAN: Well, I still say, is it
18 significant given that we are talking about 500,000?

19 MR. D. POCH: Well, we can leave it then,
20 Mr. Chairman. It is obviously a matter of
21 interpretation.

22 Q. A point of clarification, Mr. Burke:
23 Page 12 -- just a second I will just make sure I have
24 got the right -- in Section 4, fuel switching potential
25 by year 2,000, so page 12 of this exhibit.

1 THE CHAIRMAN: Number?

2 MR. D. POCH: 257.

3 Q. You have given us energy savings in
4 kilowatthours as well as megawatts, capacity savings.

5 You had indicated - you spoke about the
6 fact that you tried to mirror - I think you mirrored
7 the 16-hour peak impact effects for your megawatt
8 numbers; is that right? Does my memory serve me well
9 on that?

10 MR. BURKE: A. The footnotes give the
11 full set of assumptions. I don't know what you mean by
12 "mirroring", but essentially as it says in footnote 3
13 of table 7, "estimates, our 16-hour winter peak savings
14 at generation level". And the fourth talks about the
15 load factors used to convert energy to peak.

16 Q. Yes. And I am advised - at least my
17 my advisors tell me that the load factors, they appear
18 to be appropriate for peak savings at the generation
19 level for the 16-hour winter peak. And I wanted to
20 know if that was the case or not; and if so, do the
21 energy savings shown refer to total energy that would
22 be saved over the whole year or just to the energy
23 saved on the 16-hour winter peak?

24 A. Oh. No, that is total annual energy
25 saving in the year 2000.

1 Q. Then I think that is sufficient,
2 thank you.

3 All right. Now, one more question on
4 numbers here: Can we take a look in appendix C2 of the
5 scenarios document, which is Exhibit 258? This is
6 Case B. And we see there that there is 5360 megawatts
7 of EEI potential noted and 3120 megawatts of fuel
8 switching potential.

9 I have got that right, I trust?

10 A. Yes.

11 Q. And if we turn to Exhibit 257, of
12 page 15 of that exhibit, the last page, Table 9, there,
13 the fuel switching potential is also noted at 3120.
14 The EEI potential before fuel switching is 6380 and
15 then you show the offsetting effects of fuel switching
16 on the EEI potential, 1020 to get this 5360 number?

17 A. Yes.

18 Q. So, 5360 is potential EEI after
19 accounting for the overlap, if you will, between
20 potential fuel switching and potential EEI?

21 A. Yes.

22 Q. All right. Then if we go back to
23 Appendix C2 of 258, we see that of the 3120 potential
24 in this scenario, you show 270 mandated and 790 program
25 attained fuel switching. I add that up to be 1060. I

1 think I have added it wrong - no, 1060.

2 A. Yes.

3 Q. That would be 50 per cent of the fuel
4 switching potential in that scenario?

5 A. No.

6 Q. Oh, I am sorry, you are absolutely
7 right.

8 All right. There is 1060 attained. I
9 take it then if that is actually achieved, the
10 difference between 1060 and 3120, which is 2060
11 megawatts, off the top of my head, of unachieved fuel
12 switching, wouldn't that remain in the block of
13 electricity users and thus, eligible for targeting of
14 EEI potential, EEI programs?

15

16

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...

1 [3:02 p.m.] A. That gets to an issue that I think Mr.
2 Wilson addressed in his direct but is also quite
3 explicit in Exhibit 258 on page 5. One of our basic
4 assumptions is that, I think as it says on the bottom
5 of page 5 in the middle of that paragraph:

6 For each customer, fuel switching will
7 dominate where economic. That is, once a
8 customer is identified as a candidate for
9 fuel switching, the definition stays the
10 same and this customer is no longer
11 eligible for space and water heating EEI
12 programs during the forecast horizon in
13 this analysis.

14
15 And the reason we did this, or felt
16 obliged to do something like that, was that our
17 estimates of penetration rates reflect a certain, an
18 assessment of how difficult it is going to be to access
19 customers, to get them to make decisions.

20 We felt that we couldn't suddenly say, if
21 we are only going to get 30 per cent of the customers
22 with EEI, we could suddenly turn around, cream off the
23 30 per cent for fuel switching and then go around and
24 get 30 per cent of the remainder and end up with 60 per
25 cent of the customers all of a sudden making a

1 combination of fuel switching and EEI decisions,
2 especially if they thought they had a choice between
3 the two.

4 What we are essentially saying is we want
5 customers to fuel switch; that's what we mean by it
6 dominates. It is the more valuable switch, it is the
7 more valuable change, from our perspective, so we are
8 essentially suggesting that those numbers reflect what
9 we expect to get in the marketplace and we don't expect
10 to be able to double up somehow.

11 Q. So, I had read that comment about
12 fuel switching would be the first priority as meaning
13 that if someone fuel switched, you wouldn't count them
14 any longer in the potential EEI.

15 But now what you are telling me is that
16 these numbers, the bottom line numbers you have given
17 us are, for example, in the case where you have got --
18 in the residential sector, program driven -- let me see
19 if I understand this correctly. You are assuming you
20 are going to get 23 per cent penetration for
21 program-driven fuel switching in residential sector
22 comparable to the number you have used for EEI, and the
23 77 per cent of that market, the potential fuel
24 switching market that doesn't bite, you will not treat
25 them with EEI. You have netted your EEI numbers so you

1 don't bother going into those homes for the reasons you
2 have just given us.

3 A. Well, effectively not by the year
4 2000. What we are saying is we can get 23 per cent of
5 the market once in this decade and that's all we think
6 we can get.

7 If upon further examination, some
8 combination of EEI and fuel switching seems feasible --
9 but it didn't strike us when we did this analysis that
10 we could hold out the possibility that if people didn't
11 fuel switch they could subsequently be eligible for EEI
12 programs. We felt that was an unrealistic real world
13 case so that as we intended to encourage people to fuel
14 switch, really the issue is: What proportion of them
15 can fuel switch? And in a certain period of time like
16 a decade, I am not sure when you can identify that
17 someone has not made the decision to fuel switch and
18 therefore becomes eligible for EEI. It didn't seem
19 practical to count the person twice.

20 Q. Let me understand the implications,
21 first of all, just in terms of the numbers.

22 In that voluntary situation,
23 program-driven scenario, we have fuel switching
24 potential roughly two-thirds of EEI potential -- I'm
25 sorry, that's potential generally.

1 A. Well, that's the point. We are not
2 talking about appliance EEI and all that stuff. We are
3 only talking about weatherization of houses that we are
4 trying to switch to the different fuel.

5 Q. I just want to be sure I understand
6 this. Any house eligible or any heating load or water
7 heating load eligible for fuel switching, even though
8 you know you are planning only on getting 23 per cent
9 of that, because of this mechanical problem of which
10 comes first, that load is assumed not to be available
11 as a part of the economic potential any more. The full
12 100 per cent of that fuel switching economic potential
13 is unavailable to be targeted for EEI.

14 A. In the period to 2000.

15 Q. In the period to 2000.

16 A. But only the portion of EEI that
17 relates to space and water heating measures.

18 Q. Right. And as we saw, there were --
19 wouldn't this create other problems, though? For
20 example, we saw with Ms. Sharp's memo, that once you
21 weren't going in there to conserve on heating, you
22 weren't going to target that for the 15-minute walk
23 through audit, I think it was, because it just wouldn't
24 be attractive to do.

25 A. I think it is premature to talk about

1 the programs that are going to deliver this, and it is
2 clear that in the way we have chosen the estimates for
3 market penetration that we don't claim to know what we
4 will really get in practice. This was a simplifying
5 assumption which may be realistic. And if one was to
6 be operating in a world as you described hypothetically
7 where we could encourage efficiency improvements in gas
8 heated houses and so on things might be different.

9 Q. You have of course anticipated where
10 I am going, which is, if you are not worried, if you
11 have got a co-operative kind of program and you invest
12 in an efficiency improvement in a house and then it
13 turns out that that person switches to gas, if you have
14 a way of accounting for that, in rough terms between
15 you and the gas utilities, or if you have a way of
16 sharing the cost of those programs, it wouldn't matter.
17 We could have our cake and eat it too.

18 A. I guess the question is how long it's
19 going to take to figure out the way to get your cake
20 and eat it too in practice.

21 Q. Even without this kind of
22 co-operative world we would like to see, isn't it
23 possible you could go in and give people an option to
24 fuel switch, you would target sectors, give them an
25 option to fuel switch, if they elect. If they don't

1 fuel switch, then you treat them with EEI immediately.

2 You are "in there already" kind of thing?

3 A. Yes. And the question is will you
4 get in total more than 23 per cent of the customers
5 choosing one or the other of the options. If our
6 estimate of 23 per cent is based on some behavioural
7 characteristics of customers, then maybe we will only
8 get 23 per cent of the customers to do something,
9 either fuel switch or EEI.

10 There is a presumption that somehow you
11 can get more than 23 per cent of the customers to do
12 something here. In fact, I might claim that if the 23
13 per cent is the best estimate of the number of
14 customers who are prepared to make any significant
15 change in their dwelling this decade, then we may have
16 the maximal numbers here. That is, we have assumed
17 that they all fuel switch.

18 It could be that given the option, some
19 of them will fuel switch and some of them will only do
20 EEI. At this point we don't know whether more than 23
21 per cent of the customers are likely to make some major
22 change to their heating system. And that's really the
23 issue. If we find out that some package of measures
24 might yield more than 23 per cent, we might consider
25 it. But at this stage this may actually be an

1 optimistic way of looking at it.

2 Q. What you are saying is that you see
3 as one possibility that after you have gone and gotten
4 23 per cent of eligible potential in this niche to fuel
5 switch, of the remaining 77 per cent, none of those
6 people are participant kind of people. And then it is
7 not reasonable to expect that when you went in there
8 with your EEI program, guns blazing and incentives in
9 your holster, you wouldn't be able to get even 23 per
10 cent of them, you would get zero per cent of them.
11 That's what you would have to get for your scenario to
12 hold true; right?.

13 A. By the year 2000.

14 Q. Yes.

15 A. I think that's very important because
16 the way you are describing it is sort of like we can
17 instantaneously determine which 23 per cent are going
18 to opt for this. It is going to take us 10 years to
19 figure all this out. And at the end of 10 years we
20 will know which 23 per cent opted and then we might be
21 able to something about it.

22 MS. FRASER: A. I would also point out
23 again 23 per cent is an average over the 10 years and
24 it is also an average over the potential. Some
25 customers may save every little bit of saving or switch

1 every little bit in their house; others may just do
2 partially and that 23 is a composite as opposed to
3 talking about 23 per cent of the customers or 23 per
4 cent of potential. It's the kilowatthours.

5 Q. Just before I move on to another
6 topic, we saw before the lunch break how Hydro had
7 programs which were adding load and we saw in your
8 principle, 3.1 I believe it was, electrotechnology
9 transfer, that you would assist in electrotechnology
10 transfer even though it may increase loads and you
11 would do so where there were customer benefits or
12 environment or broad provincial wellbeing grounds. Is
13 that right?

14 A. Yes, that's correct.

15 Q. What do you mean by, in 3.3 the
16 principle, I see from my notes here, improves Ontario
17 economy.

18 MR. BURKE: A. First of all, Mr. Poch,
19 I would like to clarify. In the adding of load, the
20 assist did not involve incentives, this is
21 information --

22 Q. Mr. Burke, I thought we discussed
23 this yesterday and we agreed that you spend significant
24 sums of money on research and development and that that
25 was given --

1 THE CHAIRMAN: He has said it is around
2 \$200,000 a year.

3 MR. D. POCH: Q. We will come to
4 research and development later, but that is a form of
5 incentive, right, Mr. Burke?

6 MR. BURKE: A. Well....

7 MR. D. POCH: Mr. Chairman, I am not
8 dwelling on the net impact here so much as the
9 asymmetry in approach. And I want to test whether the
10 rules on the one hand apply equally on the other.

11 My point, quite simply, is that it
12 appears that Hydro is prepared to do what it can - it
13 may not do a lot - but to do something that can add
14 load on this test of "improve the Ontario economy", and
15 I want to see if they are prepared to do the same where
16 it reduces load and indeed where the potential we would
17 suggest is much greater to improve the Ontario economy.

18 MS. FRASER: Is there a question on the
19 floor? Or do you just want me to talk some more?

20 MR. D. POCH: Q. No, don't take that as
21 an invitation. (laughter)

22 I asked what does "improve the Ontario
23 economy" mean in that principle, 3.3.

24 MS. FRASER: A. An example of that would
25 be if the adoption of the electrotechnology would

1 improve the competitiveness of, for instance, a
2 manufacturing plant.

3 Q. Okay. I take it then it's not done
4 on the total customer cost test kind of basis; it is
5 done on a different style of test?

6 A. Yes, in fairness we have certain
7 research facilities that are there and that we have
8 been using. And the fact that there are opportunities
9 to also use those facilities to the benefit of a
10 particular industry is something that we -- I think one
11 good example is microwave drying with ceramics where
12 the production process which in elapsed time was 26
13 hours under the regular way of drying switched to
14 something like minutes.

15 Q. So, your point is that your position,
16 Ontario Hydro's position, is to be able to help
17 customers here and your concern in deciding whether or
18 not to help and give them that benefit is not whether
19 or not it's in the interests of the utility or passes a
20 total customer cost test against some avoided cost, or
21 what have you? You have said from the customer's
22 perspective, if it helps we will help. Or if it shows
23 benefit by creating employment, something like that,
24 that's a good enough justification to get involved and
25 offer your expertise, which you have? ...

1 [3:20 p.m.] A. Yes. Frankly, I am not aware if we
2 have done that type of economic analysis with respect
3 to these projects because of the difficulty of
4 incremental cost involved in using our own facilities.

5 However, I would expect in the realm, in
6 terms, of total energy service or total, even total
7 electric service, that when you can achieve gains of
8 moving from 26 hours of a process down to a matter of
9 minutes, that the value the customer gets out of using
10 that electricity has improved dramatically. I think
11 that's a responsibility that goes with a supplier of
12 any product.

13 Q. In fact, if you look at Exhibit 74,
14 page 39, at the bottom it says:

15 If the electrotechnology results in the
16 production of a new product or increased
17 production of an existing product, it may
18 increase both electricity demand and
19 total energy demand while providing a
20 boost to the Ontario economy. Therefore
21 a demand management program includes
22 programs which may increase demand as
23 well as programs to reduce demand.

24 I am just wondering why it is, in that
25 limited way, admittedly, you are prepared to see job

1 creation, boosting the Ontario economy, increased
2 production for a customer as a justification to lend
3 your capability and expertise and resources - not just
4 lend, give your resources - and when we get to demand
5 management as we have seen again and again, the cap is
6 up to the point it's economic against supply. You
7 don't use the increased job creation potential we have
8 seen in your own evidence attributable to conservation
9 as a justification to go further, we don't see
10 environment, as you have agreed, as a benefit, as a
11 justification to go further, apart from whatever is in
12 this 10 per cent which we will come do. It seems to me
13 that is an asymmetry. Is that not an asymmetry, in
14 your view?

15 MR. BURKE: A. I would just like to make
16 a comment on the going above total customer cost from
17 the job's perspective. It would be my view that to pay
18 more for demand management than supply would not
19 increase jobs in Ontario, and that, in fact, part of
20 the benefit, the economic benefit, the job benefit of
21 demand management arises because it is a lower cost way
22 of meeting energy services than supply, and that you
23 rapidly run the risk of going in the other direction by
24 exceeding the total customer cost test.

25 MS. FRASER: A. I might also add

1 something I had forgotten earlier. In fact, when we
2 were pursuing some initiatives which added load, all of
3 those basically had to pass the no-loser test. We used
4 the net revenue test at that point as we called it, but
5 it was essentially the no-loser test.

6 Q. So, it had to add electricity load?

7 A. It had to add load that did not cost
8 more than what it cost us to supply it.

9 Q. And it had to add electricity load,
10 you had to have added revenue from that customer?

11 A. The net revenue test, yes.

12 Q. And you didn't worry about what it
13 did to gas customers, I take it.

14 A. No, but electrotechnologies, I think,
15 are sort of out of the ballpark of -- you can't use
16 similar kinds of substitutions.

17 Q. You don't see an asymmetry there?

18 A. I see electrotechnologies in a very
19 special kind of category. If we were just using it for
20 space heating, water heating, all those sorts of
21 things, we can talk about the symmetry on those issues.

22 Q. Let's move on.

23 MR. SHALABY: A. Before we do, I will
24 read a couple of lines out of page 38, Exhibit 74. It
25 says:

1 The development of part of this
2 potential - this is the demand management
3 potential - is consistent with a reliable
4 supply at low cost.

5 Then it says:

6 Demand options are also judged to have
7 relatively favourable environmental and
8 social impacts and are generally
9 acceptable to customers providing they do
10 not infringe on a customer's freedom of
11 choice or lead to significant inequities.
12 So, there is...

13 Q. There is acknowledgement.

14 A. Of environmental and social impacts
15 that are favourable associated with demand management.

16 So, that is asymmetry, or however you
17 described it, is not entirely --

18 Q. But you still won't develop those
19 things, you won't help those alternatives unless they
20 happen to meet your avoided cost test, your dollars and
21 cents test.

22 A. With a premium. That premium that we
23 add is to capture some of these environmental and
24 social favourable impacts.

25 MR. WILSON: A. Mr. Poch, you are saying

1 we won't develop those things. Can you elaborate just
2 a touch?

3 Q. You screen economic potential of DSM
4 programs or measures to the ones that you will assist
5 with incentives, what have you, to those that are
6 cost-effective compared to your supply option.

7 A. That screen criteria is not applied
8 to research; it is applied to programs.

9 Research of is often -- it is funded to
10 improve the economics and performance of
11 electrotechnologies that save electricity, and we have
12 got a long history of doing exactly that.

13 Q. I do promise you again I will come
14 back to research and design and we will discuss that at
15 that time, how's that.

16 Moving on then. Principle 3.11 speaks of
17 capturing a large part of the potential, and, in fact,
18 it's 3.11.1 says:

19 Incentives should be high enough to
20 encourage the development of a large part
21 of the potential that is beneficial to
22 customers in total.

23 Could you turn up Exhibit 73, part F. Do
24 you have that?

25 MR. BURKE: A. What is the page number?

1 Q. It's page 10 of part F. Part F is
2 the last section before you get to the appendices,
3 which are numbered A-2 and so on.

4 MR. WILSON: A. We have it now.

5 Q. In fact, just to put this in context,
6 this is a response to Select Committee recommendations
7 that begins on page 9, and when they told you to be
8 aggressive, aggressively pursue economic demand
9 management options, your reply was:

10 Hydro agrees that Ontario must extract
11 the maximum economic potential from
12 efficiency improvements in the use of
13 electricity.

14 Have I got that right?

15 A. I think you maybe skipped a word or
16 two.

17 Hydro agrees that Ontario must extract
18 the maximum economic efficient potential.
19 So, I think Hydro degrades that Ontario
20 must do this.

21 Q. Okay. And I take it what you are
22 indicating there, there is a role for government as we
23 have seen.

24 A. And for all of us.

25 Q. Yes. And I see now that your

1 strategy element talks about a large part. Has your
2 position changed since this this communication was
3 issued?

4 A. I don't think so, no.

5 Q. So, getting the maximum economic
6 potential is still the goal and you are just saying
7 it's not just your role.

8 A. That's correct.

9 MS. FRASER: A. I think we would also
10 say it's not just incentives.

11 Q. Okay. Let's move on then. A related
12 question, that is part 4 of my cross-examination
13 outline and the topic of implementing to the extent of
14 cost-effectiveness.

15 THE CHAIRMAN: Perhaps if you are going
16 to a new part, this would be a good time to take the
17 break.

18 MR. D. POCH: Sure, Mr. Chairman.

19 ---Recess at 3:30 p.m.

20 ---On resuming at 3:50 p.m.

21 THE CHAIRMAN: Please be seated.

22 Mr. Poch?

23 MR. D. POCH: Q. Mr. Burke, I hate to do
24 this to you, but you were kind enough to give us the
25 numbers for 2014 and 2015 for fuel switching and

1 standards and EEI all netted out. We just had a
2 discussion where I gleaned for the first time, my
3 understanding for the first time is that there is this
4 exclusionary rule where if somebody is potentially
5 eligible for fuel switching, even if they won't fuel
6 switch, you have not included them in the potential for
7 EEI up to the year 2000. You tell me, though, that you
8 would imagine that in subsequent iterations they could
9 then be gotten at, maybe before 2000, maybe after,
10 depending how program design works out.

11 Could you check and find out whether the
12 numbers you gave us for 2014 and 2015 include only --
13 are on the same principle, this exclusionary rule
14 carrying forward, or whether that exclusion stops at
15 some point and then the people who have not fuel
16 switched say by 2000 are eligible for EEI and are
17 included in that?

18 I am assuming you probably just, as you
19 said, it was a simple extrapolation. Assuming it was a
20 simple extrapolation, could we get a scenario where,
21 say, at the year 2000 anybody that hasn't fuel switched
22 would then be eligible -- then that portion of
23 potential would be eligible and become part of the
24 economic potential for EEI.

25 Do you grasp what I am getting?

1 MR. BURKE: A. You are looking for a new
2 scenario, not one that we have given you so far, and
3 you are interested in only changes after the year 2000.
4 You are talking about Case C, for instance, is that
5 what you are interested in?

6 Q. Yes, perhaps I could narrow it to C
7 as an example to try to keep your workload down.

8 I don't know if 2000 is a reasonable
9 year, but let's take 2000, or you can propose an
10 earlier reasonable year if you refer.

11 A. Let's put it this way, the reason we
12 did the analysis for the year 2000 was because we have
13 the EEI potential very carefully worked out for the
14 year 2000. To work it out for a large number of other
15 years will be a fair bit of work, and this is, in a
16 way, a major undertaking you are asking. So, as long
17 as you appreciate that that's what it is...

18 MR. D. POCH: Well, I am quite willing to
19 be flexible here, Mr. Chairman, before Mr. Campbell
20 objects, and try to structure this request in a way
21 that is easiest for you to comply with.

22 I took that to be, leave 2000 as you have
23 said it, with this exclusionary rule in place until
24 2000 --

25 THE CHAIRMAN: Perhaps you would explain

1 to me what you mean by an exclusionary rule. Does that
2 mean the 77 people that don't take up one or other of
3 the EEI or FS options? Is that what you mean by
4 exclusionary rule?

5 MR. D. POCH: I understood, and Mr. Burke
6 can perhaps correct me if I am wrong, I understood the
7 way it works is there is assumed, by the year 2000, 23
8 per cent of the potential fuel switchable load will in
9 fact be switched by programs, and this in the program
10 scenario, but nevertheless, the entire potential fuel
11 switchable heating and water heating load is not
12 eligible for energy efficiency improvements, even the
13 77 per cent of that potential that doesn't switch.

14 I am interested in now saying, okay,
15 assume the 23 per cent switches as you have assumed by
16 the year 2000, the 77 per cent that remains, can we
17 then ask what would be the result by 2014 or 2015, if
18 they were, as of some magic date, then eligible for you
19 to try to get them to become efficient with that
20 electric space heating and water heating that remains;
21 that is, the non-participants of fuel switching.

22 I think we were just talking about Case C
23 as perhaps the one closest to your 1500 estimate may be
24 the scenario to work with.

25 Does that help, Mr. Chairman.

1 MR. BURKE: The simplest case is Case A.

2 THE CHAIRMAN: I want to hear what Mr.

3 Burke has to say first.

4 MR. B. CAMPBELL: I think Mr. Burke
5 indicated that the simplest case is Case A.

6 I guess what I would like to suggest is
7 rather than working out the permutations and
8 combinations on the record, I am quite content, I think
9 Mr. Burke is, subject to Mr. Burke indicating that in
10 any case this is going for a huge amount of work, I am
11 content to leave it this way, that we will see if a
12 satisfactory scenario can be worked out with Mr. Poch
13 that doesn't involve an undue amount of work, and then
14 just deal with it outside the hearing. I think it is
15 clear from what Mr. Burke was saying that something can
16 be done along these lines.

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25 ...

1 [3:55 p.m.] I just don't know if it is the best use
2 of hearing time to worry about exactly what it is going
3 to look like because Mr. Burke may have to check with
4 his analyst as to exactly what combinations of
5 information are easier or harder to deal with.

6 So, if that is satisfactory to Mr. Poch,
7 we are quite willing to give the undertaking. I just
8 don't want to be tied down too closely yet to the exact
9 combinations, but we could discuss that with him.

10 MR. D. POCH: If that satisfies the
11 hearing panel, we could pose the undertaking as,
12 provide the scenario where non-participating fuel
13 switching potential is eligible for efficiency
14 improvement, and we can work out the details of the
15 dates and so on later.

16 THE CHAIRMAN: And on the understanding
17 if it is reasonably feasible to do; and if it is not
18 reasonably feasible to do, you will be back.

19 I haven't had a chance to really consider
20 this and how this information will be helpful to us in
21 making the decisions that we have to make. I do know
22 that for some reason, Hydro hasn't found it necessary
23 to make that kind of analysis up to this point -
24 perhaps because of time constraints, who knows - I am
25 not going to make any comment on that, but that would

1 be perhaps one criteria as to the usefulness of the
2 information and I am not going to make any further
3 comment on that at this time.

4 MR. D. POCH: Thank you, Mr. Chairman.
5 Just to assist you on that, I had understood Mr. Burke
6 to say that he did anticipate this kind of program
7 difficulty of trying to decide when it is you gave up
8 trying to convince someone to fuel switch and then when
9 you tried to convince them be to be efficient, but that
10 in the long-term you could do that and that is why I am
11 restricting this request to the long-term.

12 THE CHAIRMAN: Can we have a number for
13 that?

14 MR. NUNN: 267.6.

15 THE CHAIRMAN: 267.3?

16 MR. NUNN: .6.

17 THE CHAIRMAN: 267.6.

18 ---UNDERTAKING NO. 267.6: Ontario Hydro undertakes to
19 provide the scenario where
20 non-participating fuel switching
potential is eligible for efficiency
improvement.

21 MR. D. POCH: Q. We are going to get
22 into part 4 of the cross-examination. Unfortunately,
23 there is no linear relationship between the length of
24 the outline and the length of the cross-examination.

25 THE CHAIRMAN: Should I be encouraged or

1 discouraged by that?

2 MR. D. POCH: Oh, encouraged, Mr.
3 Chairman, because you will have an opportunity to hear
4 more of this wonderful cross-examination.

5 Q. In Volume 2 of our materials, Exhibit
6 270, at page 132, we have reproduced an interrogatory
7 answer in which it is indicated that Hydro is committed
8 to pursuing all economic demand management
9 opportunities. Hydro does this irrespective of
10 customer size or ease of implementation.

11 And first of all, can I take that as
12 equivalent to the goal that you will pursue all energy
13 efficiency resources available for less than Hydro's
14 avoided cost, emphasis on the word "all"?

15 MR. WILSON: A. We have a statement in
16 our strategy that we will pursue all market segments
17 and most end uses. I just am not positive that we have
18 enough information right now to say that there is
19 something we can do with every single end use with
20 every customer in the province, but that is our general
21 intention.

22 Q. I understand. And over the long
23 haul - and I think this may be for you, Mr. Shalaby -
24 over the long haul, once you have optimized your
25 system, you would expect the cost of supply to give you

1 an inclining supply cost curve at that point, that
2 apart from the lead time constraints, which we
3 understand don't always allow you to do the optimal
4 thing, once you are at that point, you will do the
5 cheaper options first and so on, and we are talking on
6 the supply side?

7 MR. SHALABY: A. I think you have more
8 optimism than I would. This idea of once you optimize
9 the system, I think is an illusion. You try and you do
10 your best, but I am reluctant to use some day on
11 October 19th, 1997, we say we have optimized the
12 system. It wouldn't happen. The system will always be
13 a little suboptimal one way or the other.

14 Q. All right. But the general point I
15 am making is that when the system is near optimal, then
16 you would expect that there would be this inclining
17 supply cost curve, cheaper options. You would have a
18 number of options. You can line them up and needless
19 to say, if you need more supply at that point, you
20 would go for the cheaper ones first?

21 A. Some options are limited. They are
22 low cost, but they are only a very limited amount of,
23 such as good hydraulic sites, for example.

24 Q. Right.

25 A. Other options are available in nearly

1 infinite quantities.

2 Q. So, some of the blocks may be
3 constrained; some of the blocks may be very large?

4 A. That's right.

5 Q. All right. And given that shape of
6 supply curves and the logic of that economic dispatch
7 for the supply resource, doesn't it follow that in that
8 time frame avoided costs would be higher for greater
9 loads and lower at lower load growth rates?

10 A. I think we have seen in Panel 3 that
11 avoided cost in the long term is similar whether you
12 have a large amount of increase or a small amount of
13 increase.

14 Q. Oh.

15 A. In the short term perhaps you would
16 be pressed into expensive options in the short term if
17 demand increases tremendously more than you think, but
18 in the long term, the avoided cost should be similar.

19 Q. I had understood there was more
20 economic potential for demand management generally and
21 this is something I had taken from Panel 1 or Panel 3 -
22 I can't recall.

23 Generally, you have more economic
24 potential for demand management if you have a higher
25 load growth, and I assumed that meant because avoided

1 costs are higher. You have a greater need and,
2 therefore, you are going to get into more expensive
3 supply otherwise.

4 A. I think it is partly because the
5 stock is larger. There are more houses, more
6 factories, more office buildings.

7 Q. Okay.

8 A. And partly because avoided cost is a
9 little higher, but I think both factors are at play.

10 Q. All right. I know this notion of
11 supply curves of arraying your options by price and
12 availability is something that you do.

13 I take it you also do the same on the
14 demand side, you construct.

15 A. We don't do it very much on supply.
16 I don't know that we have put the supply options in
17 terms of curves.

18 Q. You do it on the demand side though.

19 A. The demand side though, because they
20 are of limited opportunities, you can line them up that
21 way; on the supply, I don't think we have done that.

22 Q. Okay. I have provided a very
23 simplified hypothetical set of curves in materials in
24 this Volume 2, which is Exhibit 270, at page 1.

25 Could you turn that up?

1 Now, let me say, Mr. Chairman, I have
2 been most cautious of your concerns. We have labelled
3 this hypothetical illustration.

4 And Mr. Shalaby, I am not asking you to
5 agree that the particular curve or height or price
6 quantities on this graph is representative of Ontario
7 Hydro. It is just there as an aid to help us deal with
8 the concepts, if I may.

9 And just by way of explanation, what we
10 have done here is put two curves on the same table and
11 we have flipped them side to side so that we have a
12 demand side curve starting in the lower left and rising
13 to the upper right, and a supply side curve starting on
14 the lower right and rising to the upper left. They
15 share the same vertical axis, but as you can see at the
16 bottom, there are opposing quantity axes on the bottom
17 because the curves run in the the opposite directions.
18 And the top line there is simply the sum of the two
19 curves at any point.

20 Do you see that, Mr. Shalaby?

21 A. I do.

22 Q. And the 'Y' axis then, the vertical
23 axis in a typical curve would be cents per
24 kilowatthour. That is fairly common and it is here, I
25 take it.

1 And the 'X' axis, then since the cost
2 rises as we get more for supply as we go to the left,
3 correspondingly, it would be the lower scale there,
4 zero on the right up to 100 terawatthours on the left
5 would apply to the supply cost curve; and the demand
6 cost curve runs in the other direction, gets steeper
7 towards the right as you add, as you move towards 100
8 terawatthours of demand.

9 Is that clear to you, Mr. Shalaby?

10 A. Yes.

11 Q. All right. Now, if we have a
12 hypothetical need as we have constructed here in this
13 utility to find 100 terawatthours, this graphic is
14 meant to illustrate any number of alternatives. You
15 could take the whole supply cost curve or the whole
16 demand side curve or a mix of the two.

17 And if we can go to the first variation
18 on the overhead, I have just highlighted this to help
19 the discussion.

20 Do you see that picking any point along
21 this hypothetical demand side cost curve implies a
22 certain quantity and cost of resources from that
23 source? Any point along that curve line we have
24 highlighted in red on the overhead.

25 I take your nod as a yes.

1 A. Yes.

2 Q. And do you see how that if we pick
3 any point as we have done on the next version, we go so
4 far along the curve - in this case we have gone up the
5 supply curve from the right to the left and we have
6 just arbitrarily said, okay, let's stop when we get to
7 the six cent measures, that if we had the need for 100
8 terawatthours, it would imply we would then fill that
9 need with demand options coming from the left on the
10 bottom up until we hit that vertical dividing line.

11 And that if we wanted to know what that
12 would cost, it would be the areas under the amount of
13 the supply curve we have used plus the area under the
14 demand curve remaining.

15 Do you grasp that, Mr. Shalaby?

16 A. Yes.

17 Q. All right. Suppose we met all the
18 supply requirements with supply, would you agree that
19 the cost would be the area under that whole curve as we
20 stencilled in on this version of the overhead?

21 A. Yes.

22 Q. All right. And if we want to go then
23 to the original version --

24 A. I am not going to get picky about one
25 dimension being terawatthours and the other one being

1 cents per kilowatthours, but--

2 Q. Yes.

3 A. --the appropriate millions and
4 billions will be added in here; is that right?

5 Q. Yes, exactly.

6 A. Okay, right.

7 Q. We are just trying to deal with some
8 little rough concepts here.

9 A. To show you I am saying yes being --

10 Q. You are showing me you are paying
11 attention.

12 A. No problem.

13 Q. And again, if we want to pick a mix
14 as we did in the original one, we pick the mix at the
15 point where the two lines happen to intersect, the cost
16 of resources would be the hatched area on this one?

17 A. Yes.

18 Q. All right. And indeed, this hatched
19 area, the scenario where you pick the mix of demand and
20 supply where those two lines cross, is the optimal
21 solution to this little mathematical problem of when we
22 get the least area under the curves, correct? It is
23 when you have taken demand up to the marginal cost of
24 supply or vice versa?

25 A. Yes.

1 Q. Right? And in this general sense,
2 would you agree that the situation holds for Hydro that
3 every megawatt of demand-side resources, taking into
4 account load factors and what have you, displaces a
5 megawatt of supply that would otherwise be added to
6 meet the balance of power requirements?

7 A. Yes.

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1 [4:08 p.m.] Q. If we don't get a megawatt of the
2 cost-effective demand, we are going to go with supply
3 and we would go beyond that optimal intersection point,
4 we would go up the supply curve as it were in this
5 hypothetical.

6 A. If what happens would you go up
7 the.... Sorry?

8 Q. If we don't get the full amount, the
9 optimal full amount of demand side resources, demand
10 side resources cheaper than the supply, we are going to
11 shift the vertical line here. How we will fill the
12 resources on this hypothetical example, we would shift
13 that vertical line to the left and take some more of
14 the supply up above the demand costs curve there, total
15 costs would go up?

16 A. Yes.

17 Q. And you have agreed that where these
18 curves intersect is the theoretical least cost
19 allocation of demand and supply resources. Put another
20 way, this minimizes the costs of increasing
21 requirements. It's an equilibrium point when the
22 marginal costs of demand and supply are the same?

23 A. Terribly over simplified of course.
24 This situation changes year by year and changes as the
25 existing system changes and a million other things

1 would change in time. But, assuming a very large
2 number of simplifications for illustration, that's
3 correct.

4 Q. I take your point.

5 So, to paraphrase your principle 3.1 --
6 we will pursue demand side resources to the full extent
7 they are economic compared to available supply options,
8 really what you are saying is you will strive to get
9 all the demand management resources up to that
10 intersection point?

11 A. Yes.

12 Q. Now, is it your understanding,
13 witnesses, that the intent that we spoke of earlier to
14 extract the maximum economic potential is then
15 consistent with this, you will, in your opinion, seek
16 to reach this optimal point.

17 Mr. Wilson, I don't know if you have been
18 following along with all this, but -- or Mr. Shalaby,
19 you can speak if you wish, if you prefer.

20 A. I answered in the positive, yes.

21 Q. To reach that point, it's agreed, I
22 take it, that you have to get all of the cost-effective
23 economic potential on the demand side up to that supply
24 side, up to that avoided cost?

25 A. The third time, yes.

1 Q. I'm emphasizing the word "all".

2 A. The word "all" subject to penetration
3 rates, practicalities --

4 Q. I am saying that may be a barrier to
5 doing that it.

6 A. Well, it's real life.

7 MR. BURKE: A. I think the point that
8 has to be very much clarified is it is not all the
9 potential. The thing that you should be plotting is
10 really the attainable potential because if you can't
11 count on having it, it isn't really a resource to put
12 on this plot.

13 Q. The question of attainable is a
14 barrier to achieving that optimality, is it not?

15 A. Well, the optimality may not be
16 feasible.

17 Q. Fair enough.

18 If you could attain, if attainability of
19 the economic potential was not a problem, then the
20 discussion we have had pertains? Mr. Shalaby?

21 MR. SHALABY: A. Your title is "Demand
22 Side Resources", that's what your DSM here in the
23 bottom left-hand corner of your diagram says, "Demand
24 Side Resources". I am assuming that these are
25 available, real resources. So, if they are available

1 we should get them.

2 Q. I am not trying to pick a fight here
3 about this. I take Mr. Burke's point that obviously
4 you can't always get what economic theory tells you is
5 ideal because--

6 A. I guess the word --

7 Q. --it's just not attainable.

8 A. Yes, the word "all" may have ignited
9 that, what's available and what's not.

10 But if say they are resources, then if
11 these are available resources, we should attain them,
12 yes.

13 Q. I guess I was looking at it the other
14 way that your test talks about getting all, getting the
15 maximum economic potential. That's the test you have
16 given us. That's the one you communicated to the
17 Select Committee. You said you haven't changed.

18 I recognize that that's goal and that
19 clearly you can't attain 100 per cent of economic, but
20 I just want to make sure we are on the same plane here.
21 That the reason you have set that test is because that
22 gets you this result. It gets you the optimal mix. If
23 you could. And we are both acknowledging, I think, you
24 can't necessarily attain that.

25 MR. BURKE: A. I may have missed some of

1 the many literature references that you were citing,
2 you but my understanding was that we had said we would
3 get the maximum economic demand management or load
4 reduction through demand management. I am not sure
5 where it actually says we are going to obtain the
6 maximum economic potential.

7 Q. I was just reading the quote, page
8 10, part F, Exhibit 73:

9 Hydro agrees that Ontario must extract
10 the maximum economic potential from
11 efficiency improvements in the use of
12 electricity.

13 A. My view about that statement is that
14 it must mean the attainable potential, not the total
15 induced potential.

16 Q. Well, I don't think anybody is
17 suggesting to you that you can attain, extract the full
18 economic potential, given the barriers, given the rules
19 that you are playing by. But I had thought the goal
20 was to get as much of it as you possibly could.

21 A. Yes. But clearly the very nature of
22 delivering programs as opposed to mandating something
23 or passing a standard has with it all kinds of real
24 world constraints that ensure that not even -- the
25 rules we are playing by aren't really even at play

1 here.

2 As indicated earlier, if we had 100 per
3 cent incentives and so on, probably wouldn't exceed 75
4 per cent penetration rates. There are real limits to
5 that sort of attainability.

6 Q. That's fine. I guess the bottom line
7 here is if you get 50 instead of 55 per cent or 60
8 instead of 65 per cent, whatever you get out of
9 whatever is in the extreme attainable, whatever you
10 don't get is going to be met by more expensive supply,
11 we are going to have to move from that optimum point on
12 the intersection point. That's all. It forces you
13 into more expensive supply.

14 A. I guess the thing I am having
15 difficulty with is whether the option is on the table
16 if you can't get it. You are talking about sort of the
17 province in some way being worse off because we can't
18 get something that really isn't obtainable.

19 Q. Let me try it another way, Mr. Burke.

20 You have set a target. You could get up
21 to 75 per cent if you went to 100 per cent incentives.
22 If you don't get 75 per cent annual penetration and you
23 only achieve 60 per cent, the difference is going to be
24 made up by supply and it is going to move you off the
25 optimal point. You are going to be substituting more

1 expensive supply, by definition.

2 MR. SHALABY: A. But what Mr. Burke is
3 saying is it is a hypothetical optimal point.

4 Q. Well, that's fine.

5 A. It would be nice to have but it is
6 not realistic to get.

7 Q. Well, let's assume that it is
8 possible and realistic to get 75, but for whatever
9 reason you just don't develop your programs well or
10 whatever, you only get 60, you would agree that the
11 result is you are going to go for more expensive
12 supply. That's what it leaves you with. Mr. Burke?

13 MR. BURKE: A. Hypothetically, yes.

14 Q. Right.

15 Now, I would like to talk about a number
16 of possible strategies that might lead to
17 underinvestment in demand side resources and
18 consequently this overinvestment in supply side
19 resources. And we are going to come back and discuss
20 some of these in terms of Hydro's programs a little
21 later.

22 And first of all, one way I think you
23 would agree to end up with too little DSM would be to
24 restrict Hydro acquisition to only the most
25 cost-effective DSM instead of all cost-effective DSM as

1 the target?

2 MR. WILSON: A. Yes, I would agree with
3 that.

4 Q. That would be what is called "cream
5 skimming" in the jargon.

6 And another strategy to underinvest in
7 DSM would be to omit measures whose acquisition costs
8 are less than the supply resource costs at that optimal
9 combination point? And you could do this through
10 oversight or you could do it as a deliberate choice.

11 A. Could you repeat that.

12 Q. If you simply omit cost-effective DSM
13 measures.

14 A. I think that's almost the same as the
15 first question you posed to us, is it not?

16 Q. Well, no, that was a strategy where
17 you go after the most cost-effective --

18 A. If we simply ignore something, I
19 think that would have the same effect. And you could
20 also choose to ignore something, consciously you could
21 do it as opposed to--

22 A. Yes.

23 Q. --by omission? You could do it
24 deliberately, I should say.

25 To the extent that you pick a strategy

1 which says lower your incentive levels below that which
2 are optimal to achieve some other objective, equity for
3 example, that would be a deliberate choice to the
4 extent that strategy has any impact that would be a
5 deliberate choice to leave out some of these
6 cost-effective.

7 MS. FRASER: A. Assuming that we knew
8 what that level was, yes.

9 Q. And to the extent that you may have
10 excluded cost-effective fuel switching, that would be
11 another example where, maybe by oversight or maybe by
12 choice, you have left out some of this cost-effective
13 potential?

14 MR. BURKE: A. You have got a
15 cost-effective curve here for EEI but I am not sure,
16 offhand, that fuel switching necessarily fits neatly on
17 this curve.

18 Q. You would agree with me though that
19 to the extent you would leave out cost-effective fuel
20 switching, even if we can't plot it on that curve, the
21 consequence is more supply, more electric supply?

22 A. Yes. You need to add all the other
23 energy forms and have a nice multi-dimensional curve
24 here to be sure you are doing the right thing.

25 Q. I gather the latest version of Lotus

1 let's us do that.

2 To the extent you have failed to include
3 cost-effective efficiency measures, for example because
4 targets are arbitrary or outdated, or avoided costs are
5 arbitrary or outdated, you might get this result as
6 well. Is that fair?

7 MR. WILSON: A. I think that's true only
8 arbitrary or outdated are less relevant than if they
9 are incorrect.

10 Q. Fair enough.

11 MS. FRASER: A. I would also point out
12 that the 2000 by 2000 was only ever seen as a minimum,
13 not the maximum.

14 Q. That's an interesting point because
15 while it is clear to me now that you and the demand
16 side management group view it that way, we are
17 nevertheless here discussing a plan where approvals are
18 being requested, at least optional approval,
19 flexibility is being requested to build supply built on
20 a DSM plan which is assumed to be 2000 by 2000, so it
21 may have less importance to you, that number, than it
22 does to the rest of us in this room, Ms. Fraser.

23 A. Well, it is of very much importance,
24 my own compensation is tied to the basis of meeting
25 those targets each year and the year 2000.

1 Q. Excuse me. Did I hear that right?
2 You have got an incentive program in terms of
3 compensation that --

4 A. No, I just don't get paid if I don't
5 get it, that's all. (laughter)

6 Q. That is, you lose your job.

7 A. No, but there are performance
8 contracts that include the targets for all the
9 managers, both in head office and in the field.

10 I guess what I would say with respect to
11 that target is that we beat the bushes to see the
12 maximum we could get and it wasn't a question of
13 optimization or any of those other things, it was a
14 question of what is the most you can do.

15 That was the basis on which the plan was
16 set and that's why, as Mr. Shalaby explained, there is
17 only one DM plan in the balance of power as opposed to
18 a range of them.

19 Q. Mr. Burke, do you agree with that,
20 that 2000 should be taken as the minimum target?

21 MR. BURKE: A. I am not sure what the
22 materiality of the target is as a matter of fact. You
23 mean, the thing we should plan on?

24 I mean a target for marketing may be just
25 something you strive to achieve. If you are asking

1 should we plan on achieving 2000 megawatts and do I
2 agree with that, my forecast, I guess, to the extent
3 that I have a role in this is that we are likely to
4 achieve that target of 2000 megawatts.

5 The possibility that we might exceed the
6 target has got to be part of the flexibility that is
7 built into the plan. I am not really the person who is
8 going to tell you how the plan will adapt to achieving
9 more than to 2000 megawatts, but I think it would be
10 wrong to say that just because 2000 is a target, we
11 have a plan which is sort of a single case with hard
12 numbers at each point. And so I am sure the plan is
13 flexible to accommodate the achievement of more than
14 2000 megawatts.

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1 [4:25 p.m.] Q. Before we got off on that, we were
2 going through a list of possible suggested ways that
3 one could underinvest in DSM, and we were in the
4 category of, through oversight or deliberate choice,
5 omitting measures, and through oversight I forgot to
6 mention another part of that, which is where there is
7 foreseeable measures but they aren't included even
8 though they aren't presently available. That's a way
9 that if we didn't subsequently move to capture those
10 you would be underinvesting?

11 MS. FRASER: A. Correct.

12 Q. And another way that Hydro could
13 underinvest in DSM is if you, in your planning,
14 systematically overstated the cost of acquiring demand
15 side resources. For example, you overstated the
16 incremental OM&A cost of DSM in planning and then that
17 was used to screen potential, then your plans could
18 understate the potential; fair?

19 A. Yes.

20 Q. All right. And hopefully that would
21 be corrected eventually once the reality was --

22 A. It's corrected the moment we get
23 programs approved.

24 Q. So, bad program design or costing
25 could lead to this result, could lead to an

1 inappropriate target and underinvestment, you might
2 correct later, but initially?

3 A. Yes. And it goes both ways. If we
4 underestimate it and then we thought something was
5 economic and we have put all of our eggs in that
6 basket, and whoops.

7 Q. Fair enough.

8 And finally, a separate category to round
9 this out, another source of underinvestment of demand
10 side resources would be if we had misplotted that
11 supply side curve, if we had underestimated the costs
12 of supply resources. If we had underestimated the
13 capital cost of a nuclear plant, I guess, would be the
14 most significant example we could come up with for
15 Ontario Hydro; is that fair?

16 MR. SHALABY: A. It's similar to what
17 you mentioned earlier, if you don't get your avoided
18 costs right, it's the same thing.

19 Q. And this could also hold true if your
20 avoided cost didn't capture current trends in
21 performance on the supply side or the costs of
22 extraordinary programs needed to achieve or maintain
23 performance, for example, or indeed, wouldn't it also
24 be true that from a societal perspective, you would be
25 underinvesting in DSM if you didn't count the

1 environmental externalities and raise that supply curve
2 by the differential?

3 A. You are not going to slip that one
4 like the rest of them!

5 Q. I didn't think I would.

6 Okay, let's move on to the level of
7 incentives then. Let's talk about the underpinnings of
8 the demand side resource supply curve that you have
9 generated, in essence.

10 To project savings potential, isn't
11 Hydro's basic approach to multiply the savings per
12 measure per year by the number of eligible customers
13 and then by the measure of penetration percentage
14 number? Savings per measure, times the number of
15 eligible customers, times the penetration number?

16 MR. BURKE: A. Well, I guess the way the
17 potential numbers are derived, the savings per measure
18 is sometimes applied as a percentage of load, or it
19 could be applied in kilowatthours per customer, either
20 way. And then having determined what the potential
21 induced is in kilowatthours, then the numbers in
22 Exhibit 76 for attainable are derived by applying the
23 penetration rates supplied by the energy management
24 branch to those potential induced estimates.

25 Q. Okay. So, I guess you are agreeing

1 with my formula and you are just showing me that it can
2 be done in a different combination of ways depending if
3 you are dealing with energy, and so on.

4 A. Yes.

5 Q. Now, I guess it's obvious, Hydro
6 tries to influence the market's adoption measures
7 through specific demand management programs - use of
8 the word "programs" here, shifting from measures -
9 designed to influence decisions made by or indeed for
10 customers.

11 Would you agree that another way to look
12 at the source of the aggregate amount of energy savings
13 that Hydro could acquire from its demand management
14 programs would be to multiply the following two
15 elements, they being the amount of savings Hydro can
16 achieve from each participant in a program, or the
17 depth of savings per customer, times the total number
18 of participants. That should get you the same sort of
19 mathematical product, if you will.

20 MR. WILSON: A. I think that is correct.
21 Possibly the only adjustment you would have to make is,
22 you are talking programs now, the customers that you
23 identify or estimate to be free riders.

24 Q. Yes. That applies to both
25 formulations. My suggested way of figuring out the

1 number or the other, you account for free riders to
2 look for the net load impact on forecast.

3 A. Yes.

4 MS. FRASER: A. I just don't want to get
5 too confused about participants and customers.
6 Customers pay bills, participants participate in
7 programs.

8 Q. Right. I am talking about
9 participants here, participants in programs.

10 THE CHAIRMAN: I am a little confused
11 because I don't see any difference between the two
12 formulas; it's a different way of expressing the same
13 formula. If there is a difference, perhaps you should
14 let me know what you think it is. You said it was an
15 alternative and it seems to me it's exactly the same
16 formula.

17 MR. D. POCH: I am not disagreeing, Mr.
18 Chairman, and I think the witnesses have agreed, it
19 should get you to the same number.

20 THE CHAIRMAN: No, it's not getting you
21 the same number, it's the same formula, so it should
22 get you the same number.

23 MR. D. POCH: Well, I had understood
24 that --

25 THE CHAIRMAN: Participants, as I

1 understand it, is the total number of customers times
2 the penetration rate.

3 MR. D. POCH: Well, I had understood that
4 the penetration rate was applied to the savings
5 potential in energy terms, not in terms of numbers of
6 customers.

7 MS. FRASER: That's correct.

8 MR. D. POCH: Q. Maybe we should clarify
9 this then.

10 If you say 30 per cent penetration, you
11 don't mean 30 per cent of customers; you mean 30 per
12 cent of the megawatt potential?

13 MS. FRASER: A. That's right. Some
14 customers can deliver a little, some customers can
15 deliver a lot.

16 MR. D. POCH: And I think it's
17 appropriate, Mr. Chairman....

18 THE CHAIRMAN: Do you mean average
19 savings per participant when you use your...

20 MR. D. POCH: Yes, I think that would be
21 an appropriate amendment, Mr. Chairman.

22 Q. Would you agree that the amount of
23 savings per customer is a function, and not exclusively
24 a function, but a function of the number of measures
25 installed by the customer? It's not linear because, of

1 course, it depends on what measures they happen to pick
2 and how many megawatts can be attributed to a given
3 measure.

4 MS. FRASER: A. It's also a function of
5 the potential within their premises.

6 Q. Yes.

7 MR. BURKE: A. I don't know where you
8 are going with this, but it's clearly possible to do
9 one space heating measure that has more of an impact
10 than quite a few other measures.

11 Q. And for that customer, if you then
12 did another measure, in very, very simple terms, it's
13 not linear, but the more measures you get in there, the
14 more you save?

15 A. For that one customer that's always
16 true, but if you are trying to compare between
17 customers it doesn't work.

18 Q. I promise I won't do a mathematical
19 manipulation here and try to imply that it is linear.

20 So, if I can just put some titles on
21 these drivers so we can go on to talk about how your
22 programs respond or deal with them. These two drivers
23 then, we could call them measure of penetration within
24 participating customers expressed as a fraction of just
25 the total number of cost-effective measures. So, for

1 the discussion which follows, we are just talking about
2 number, and I recognize that you can't translate that
3 into megawatts just for the reason that Mr. Burke gave,
4 and then customer participation which we will talk
5 about as the fraction of the eligible population
6 participating.

7 MS. FRASER: A. So, if I were to go back
8 to my favourite example of streetlighting, we had 76
9 per cent of the eligible municipalities participating
10 and they converted 88 per cent, and now 93 per cent, of
11 the eligible lights. Is that what your measure --

12 Q. I guess that's not what I am talking
13 about, because that is a single measure kind of
14 program.

15 I am talking about where you have a
16 multiple measure program. Two of the drivers you can
17 influence anyway are how many measures within that
18 program a given customer adopts and then how many
19 customers actually participate, the first would have to
20 be on average and then --

21 A. I guess this is where I think it gets
22 into a requirement to look at marketplaces and look at
23 various things.

24 In the commercial sector we tend to look
25 at a building as a total system, and that you can go in

1 and do something to one part of that system and think
2 you have saved a lot of energy, but if it puts the
3 building out of balance and out of whack, you may
4 actually be adding to the energy consumption.

5 So, if we want to talk about commercial
6 buildings, I don't think I want to add up sort of
7 individual measures and say, here is the total, but --

8 Q. But let's agree then, to simplify our
9 discussion further, we are only going to talk about
10 measures which are cost-effective in the circumstances.

11 So, since you are trying to get all of
12 the cost-effective potential to the extent you can and
13 you are not going to cream skim, and even so that
14 subsequent measures for a given customer, even though
15 they may be small, if they are cost-effective you will
16 go for them, it doesn't matter that there is a big one
17 out there at another customer because you will go for
18 that too, you are sort of committing then to get all
19 the cost-effective savings you can for any given
20 customer, and also -- so you are going to get as many
21 measures as you can that are cost-effective for a given
22 customer, and you are also going to try to get as many
23 participants as you can for a given eligible
24 population. You are going to try to maximize both of
25 these drivers?

1 A. I would say so, yes.

2 Q. Let's take a look then, within that
3 sort of constraint of a customer, for each customer
4 then, and we have pointed out that obviously the
5 potential, the savings potential in terms of energy
6 would depend on the type and the penetration of the
7 measures per participant, to help our discussion why
8 don't we consider the building we are in right now.

9 If you came into this building would you
10 agree that the effectiveness of Ontario Hydro in
11 achieving its targets would, to some extent, depend on
12 the number of the cost-effective measures that are
13 available in this building that you get the customer to
14 move on?

15 A. Yes, the more measures, the more
16 savings, assuming that they were all additive and
17 assuming that we kept the building in balance and all
18 those other things.

19 Q. And some may be very big and some may
20 be very small and we understand the caveats.

21 Perhaps I can suggest that there is a
22 number of factors at play that could influence the
23 number of measures available that are cost-effective
24 for a given customer, and they might include usage
25 patterns in the building, more hours occupied and

1 involves more energy use, thus more potential energy
2 saving opportunities, all other things being equal?

3 A. I would say so, yes.

4 Q. And the mix of energy end-uses,
5 that's partly dependent on the building usages, but
6 would include the lighting, the heating, the cooling,
7 the ventilation, the elevator, systems that are in
8 place?

9 A. Yes, all those things consume energy.

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1 [4:40 p.m.] Q. So, as well as the pre-existing
2 inventory, there is the question of what the
3 pre-existing level of efficiency is of that baseline
4 inventory, would be another determinant?

5 A. That's correct.

6 Q. And then, of course, the cost and the
7 performance of the individual measures you have
8 available to you to substitute?

9 A. Both available to us and satisfactory
10 to the customer in terms of what he uses the building
11 for.

12 Q. Now, I take it you don't do an
13 estimate of technical potential which would be the
14 potential if money was no object.

15 A. And the commercially feasible
16 technology was no object.

17 Q. All right. And we all agree money is
18 an object. It is one object at least.

19 So, let's talk about economic potential
20 in a given building. That would be the point at which
21 for this given building - this building say - there are
22 no further measures that are cost-effective in dollar
23 terms?

24 A. Yes, I think that is right. Nothing
25 else would pass the total customer cost test.

1 Q. And just to harken back to our
2 discussion about supply and demand curves, you could
3 actually construct an energy efficiency measure curve
4 for an individual facility such as this building
5 organized in the same way?

6 Mr. Burke, you are nodding.

7 And we could, in theory, then have that
8 same intersection and there would be an optimal point
9 where we would go until we hit the point when we are
10 into the supply options.

11 A. It sounds to me like you are talking
12 about my savings by design program because that is
13 exactly what we do.

14 Q. Good. And if you stop too soon or
15 you go too far, you don't get the optimal solution.
16 You are going to cause an investment in less economical
17 supply even at the level of talking about an individual
18 building, fair?

19 A. I think you could translate what Mr.
20 Shalaby said down to a building, but there's a lot of
21 other implementation things that you have got to deal
22 with called reality, so

23 Q. All right. Now let's back up a
24 minute to economic theory.

25 Mr. Burke, pure economic theory would

1 tell us that if it was cost-effective, the customer
2 would be doing it anyway.

3 You have recognized, I take it, that
4 customers in reality don't choose all cost-effective
5 efficiency measures; otherwise, it would all be in the
6 basic forecast, right?

7 MR. BURKE: A. I think the word
8 "cost-effective" is misused if you suggest that it
9 means the same thing to everybody. What is
10 cost-effective to Ontario Hydro is not necessarily what
11 is cost-effective to customers.

12 And, in fact, the different perspectives
13 that different people or agencies have about what
14 constitutes cost effectiveness is one of the major
15 reasons why a utility would be involved in demand side
16 programs at all.

17 Clearly, customers have a different
18 perspective than the total customer cost test.

19 Q. All right. Can we agree that Hydro
20 does intervene to overcome barriers to, sort of, pure
21 economic action, and those barriers may be, as you have
22 indicated, just different values or they may be market
23 barriers; fair, Mr. Burke?

24 A. If what you mean by a market barrier
25 is that different people or different agents in the

1 economy perceive things differently, that is fair
2 enough. It doesn't suddenly become uneconomic just
3 because people look at things differently.

4 I think it matters very much whose
5 perspective one is taking when one says something is
6 cost-effective. And what we have adopted for least
7 cost planning or integrated resource planning in
8 Ontario Hydro is the utility's perspective, and that is
9 almost always going to differ from the perspective that
10 its customers take.

11 Q. Well, in fact, I had thought you had
12 taken some version of the total customer cost
13 perspective; that is, the utility plus its customers.

14 Just to correct you, is that right?

15 A. Well, I think the total customer cost
16 test has many elements to it, that is true. I thought
17 what we were talking about largely, and maybe I was
18 assuming something, was the difference in discount
19 rates and so on that different customers apply and
20 which tends to make the same measure even if all the
21 same costs were on the table appear more or less
22 economically attractive to different parties.

23 Q. Okay. That is one example. Let's
24 take a look at some of the kinds of reasons that you
25 would want to then intervene. One would be limited

1 - access to relatively high-priced capital quite apart
2 from different discount rates, Mr. Burke?

3 A. Well, I think that the access is to
4 long-term capital at desirable interest rates.

5 Q. Okay. And another reason you would
6 want to intervene, Ms. Fraser or Mr. Wilson, you told
7 us about would be the split incentive scenario?

8 MS. FRASER: A. Yes, that is right.

9 Q. Landlord and tenant, for example.

10 And first of all, let's go back to the
11 first one, limited access to relatively high-priced
12 capital.

13 I take it if Hydro buys the measure or
14 covers the incremental cost, that is not going to be a
15 problem.

16 MR. BURKE: A. In what sense isn't it a
17 problem?

18 Q. Well, if we are looking at the
19 barriers to customers putting in place all this
20 efficiency that is deemed cost-effective at whatever
21 test we use, if one of those barriers is limited access
22 to relatively high-priced capital, which it might be
23 for a customer, it is not going to be a barrier if
24 Hydro buys the measure or pays the incremental cost,
25 right?

1 A. That is a way of overcoming that
2 barrier, yes.

3 Q. Right, okay. Split incentives
4 similarly, it wouldn't be a problem if Hydro buys the
5 measure or covers the incremental cost, Ms. Fraser?

6 MS. FRASER: A. No.

7 Q. Right. You could have real or
8 apparent risks of various forms that could impede
9 individual efficiency investments. What comes to mind
10 is the illiquidity of conservation investments. You
11 could necessarily resell it. That could be a barrier
12 to an individual investing on their own?

13 A. Yes, it could be.

14 Q. And again, if Hydro buys the measure
15 or covers the incremental cost, that would overcome
16 that barrier to some extent?

17 A. I guess so.

18 Q. Another real or apparent risk might
19 be uncertainty over market evaluation of efficiency,
20 market risk. It might have a known value to Ontario
21 Hydro, but the home resale market might not recognize
22 thermostat timers for their full value to Ontario
23 Hydro; fair enough?

24 A. I would agree and you are still in
25 the realm of economics.

1 Q. Yes. And again, you could overcome
2 that barrier with program design by having Hydro pay
3 for the measure or the incremental cost, right?

4 A. Yes, I guess you could.

5 Q. All right. Another problem might be
6 for an individual the fear of lemon technologies or
7 technological risk, and this can be a real risk.

8 A. That is a doozy.

9 Q. And that sort of mirrors the risks we
10 see on the supply side of new or not fully tested
11 technology. It is just in sort of more manageable
12 bites or could be a perceived risk, just due to lack of
13 specialized knowledge?

14 A. Could be real or perceived; I
15 indicated that in my evidence in-chief.

16 Q. And certainly if it is the latter, it
17 would be less of a problem if Hydro buys the measure or
18 covers the incremental cost and thus, takes on some of
19 that risk?

20 A. The extent to which that is true is
21 not clear to us yet.

22 Q. All right.

23 A. Customers don't want you messing
24 about with their building if it is going to cause a
25 problem with their tenants or have a problem with their

1 production processes if it is an industrial plant.

2 If that particular gizmo is not going to
3 do what the other one did, I don't care how much more
4 energy it uses, I am going to keep using this other one
5 until you show me.

6 Q. Right. So that can persist as a
7 problem, but certainly the greater extent to which
8 Hydro takes on the risk, the less of a barrier we have?

9 A. Oh, absolutely, and I think I
10 indicated that with respect to T8s; the fact that we
11 have put our incentive on T8s has had a strong impetus
12 to that product.

13 Q. I take it from your comments another
14 whole area of barriers would be inadequate, conflicting
15 or expensive information which makes the search and
16 evaluation costs for efficiency improvements high in
17 terms of a customer's own time or effort or
18 inconvenience, but that this again is a barrier that
19 Hydro can overcome because when you are going out and
20 buying 10-million light bulbs, there is a certain
21 economy of scale both for your use of time to
22 investigate and to shop around and so on.

23 A. There is, I guess, a number of things
24 I would caution here: One is, yes, there is that
25 ability, as you said, because the economy is a scale;

1 however, the acquisition of that data is not something
2 that is instantaneous or necessarily any easier for
3 Ontario Hydro to acquire in spite of all our great
4 minds that - and then, of course, there is a
5 dissemination aspect of it.

6 Q. Yes. But if you are going out to get
7 the information, you can afford to spend a lot more
8 gathering that information than any given customer
9 could.

10 A. Absolutely, and we do.

11 Q. And the dissemination aspect is less
12 of a concern if you were going in and taking the risk
13 and buying the measure.

14 A. That is why we are spending as much
15 as we are spending on it.

16 Q. Right. Now back to my model of
17 peculiar drivers. The number of measures a customer
18 will install was one of them.

19 And wouldn't that depend to some extent
20 on the number and the strength and the interaction of
21 all these market barriers?

22 A. All of those things are at play as
23 well as the fact that the agendas of any one of the
24 so-called "faceless participants" that we have talked
25 to about up to now probably have very, very little to

1 do with energy in a given day.

2 Q. Right. And again, if Hydro goes out
3 and buys it and installs it, to some extent you still
4 have to get in the door, but at least you have taken
5 the initiative.

6 A. Yes, and we use a number of things
7 like the shower head give-away I talked about this
8 morning as that kind of a door opener.

9 Q. And I take it that perhaps obvious
10 different market barriers affect different measures for
11 different customers.

12 A. Absolutely.

13 Q. Would you agree as a rule of thumb
14 then that the greater the number of measures that would
15 be economical to install for a given customer, the more
16 likelihood it is that there are going to be more and
17 stronger market barriers that would be run into by that
18 customer or would be at play for that customer? Then
19 but just the odds are, more measures, more likely one
20 of these market barriers is going to come into play.

21 A. I hadn't thought of it in quite that
22 way, but it would be interesting to spend some time
23 thinking about that. I am not sure it necessarily
24 follows, but the complexity of it certainly increases.

25 Q. All right.

1 A. And you might not know exactly which
2 barrier it is that you are dealing with. The customer
3 may say, I don't have the money for that, but that may
4 not be the barrier that he is actually dealing with.

5 Q. But more simply, it would be
6 generally harder for Hydro to get a customer to install
7 many measures than it would be to get a customer to
8 install only one or two, and there are going to be lots
9 of exceptions, but on average?

10 A. Yes. Well, in some cases, even when
11 it is very financially advantageous, it is hard to get
12 a customer even to install one. And I guess I would
13 cite the City of Toronto with respect to streetlights
14 in that regard.

15 Q. Yes. We are going to hopefully make
16 them twist a little over that one, or at least the one
17 alderman who is the problem.

18 A. But those are barriers.

19 Q. Yes, and --

20 A. Or that is a barrier.

21 Q. And it gets harder the more measures
22 you want to install. You wouldn't be surprised by that
23 then. That is sort of the real life implication of the
24 comment I spoke to.

25 A. Yes. And you may have to start with

1 one and move on to the other and demonstrate your
2 seriousness and your reliability with respect to those
3 things to the customer. And I can, you know, cite some
4 examples in the industrial sector where that is exactly
5 the case - well, let's try out one project and see what
6 happens. My production process doesn't fall apart;
7 well, let's talk about the second one, so on and so
8 forth.

9 Q. So to the extent we are looking to
10 Hydro's intervention to overcome these barriers then,
11 the more and more powerful the market barriers that
12 customers confront, the greater will be the need for
13 Hydro to intervene in that decision-making process to
14 get those measures installed. The more measures, the
15 more you are likely to have to intervene?

16 A. Well, yes, and that is my job,
17 so

18 Q. Okay. So to be successful in
19 overcoming these market barriers, the more measures you
20 can motivate participating customers to install and the
21 more customers you can motivate to participate in this
22 program, the more successful you will be?

23 ...
24
25

1 [4:55 p.m.] A. Absolutely.

2 Q. Now with that framework we are going
3 to look at what you do. You have got these principles,
4 "Incentives should be high enough to encourage the
5 development of a large part of the potential that is
6 beneficial to customers in total." That is 3.11.1.

7 And then you have got 3.11.2 that says
8 "Customers who participate and receive direct benefits
9 should provide a substantial contribution to the cost."
10 And you make this trade-off that we have heard about.

11 And I take it we have agreed that if you
12 set your incentives too low, you are going to lose some
13 cost-effective savings?

14 A. Yes. That's assuming that you know
15 that they are too low.

16 Q. And you can lose cost-effective
17 savings, given the analysis we have just done, if you
18 have fewer customers participating in programs?

19 A. Yes. And that would of course get
20 back to you are assuming, let's say, that all of your
21 average measures are the same in terms of kilowatt
22 savings because you can get a lot of little ones and
23 miss the big ones.

24 Q. Right. And similarly of those
25 customers who participate, you can lose if you don't

1 get them to install as many measures. I take it that's
2 the parallel?

3 Would you agree that as a general
4 proposition, higher incentives can, all other things
5 held equal, raise the number of measures a particular
6 customer is likely to install?

7 A. I guess I would like to find a
8 situation where all things are held equal. I cited the
9 situation of the Bonneville Power streetlighting
10 program where they paid 100 per cent of the project
11 cost and over five years achieved a 33 per cent
12 penetration.

13 So, from a statistical sample of two
14 programs, I would have to disagree with that.
15 Intuitively I would also have an example --

16 Q. Let me just interrupt you there
17 though. You did explain all else was not equal in
18 comparing Bonneville and Ontario Hydro, right, in
19 fairness. You attribute it to much better program
20 design in that case; right?

21 A. Modestly, yes.

22 Q. You are entitled.

23 I take your caveat all else is not always
24 equal, but if all else was equal, we can use higher
25 incentives to raise the number of measures per

1 participant and indeed the number of participating
2 customers?

3 A. I think what would be the case here
4 is perhaps if you had made mistakes with respect to
5 your assumptions about some of those barriers. And
6 therefore if you had a situation with incentive X and
7 then incentive, say, X plus 50, that you would want to
8 see what the difference was. You would probably find
9 that you had made some mistakes about whatever the
10 required payback was, what the technical risk might
11 have been, all of those sorts of things, rather than
12 just assuming that higher incentives equal higher
13 penetration.

14 Q. But you would agree that paying
15 higher incentives can overcome a variety of market
16 barriers not just access to capital at first cost?

17 A. I am saying incentives can overcome
18 barriers. Just the fact of us paying --

19 Q. Yes, I'm sorry, incentives.

20 It may be necessary but insufficient is
21 what you are telling me.

22 A. Yes. And I guess what I'm also
23 saying is just the fact of us putting incentives on
24 something will make the customer take a second look at
25 it and maybe be willing to take a longer payback on it

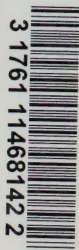
1 than they would have before and invest in it and get
2 the energy savings that result from it.

3 MR. D. POCH: Mr. Chairman, I am about to
4 turn to some examples now of how different market
5 barriers interact and how program strategies,
6 particularly higher incentives, can overcome them, and
7 it might be a convenient time to break.

8 THE CHAIRMAN: All right. We will break
9 until tomorrow morning at ten o'clock.

10 ---Whereupon the hearing was adjourned at 5:00 p.m., to
11 be resumed on Wednesday, August 28, 1991, at 10:00
12 a.m.

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